BIBLIOGRAPHY OF Technical Reports

Contents

March 16, 1951
Vol. 15, No. 3

Research on synthetic-liquid-fuels processes..... 65
Apparel..... 67
Chemicals and Allied Products..... 67
Drugs and Pharmaceuticals; Dyes..... 67
Plastics and Plasticizers..... 67
Paints, Varnishes and Lacquers..... 68
Chemical Engineering..... 68
Miscellaneous Chemicals..... 68
Deterioration Studies..... 70
Electrical Machinery..... 70
Communication Equipment..... 70
Electronics..... 71
Generators, Motors, Transmission..... 73
Miscellaneous..... 73
Food and Kindred Products..... 74
Fuel and Lubricants..... 74
Highways and Bridges..... 76
Instruments..... 76
Lumber and Wood Products..... 78
Machinery..... 78
Medical Research and Practice..... 81
Metals and Metal Products..... 81
Meteorology and Climatology..... 85
Minerals and Mineral Products..... 86
Ordnance and Accessories..... 87
Packing and Packaging..... 87
Paper and Allied Products..... 87
Personnel Aptitude..... 87
Photographic and Optical Goods..... 88
Physics..... 89
General..... 89
Psychology..... 90
Rubber and Rubber Products..... 90
Structural Engineering..... 91
Textiles and Textile Products..... 93
Transportation Equipment..... 93
Aeronautics..... 93
Aircraft..... 93
Instruments; Engines..... 96
NEWSLETTER IN CENTER FOLD

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BIBLIOGRAPHY OF

Technical Reports

March 1951

BUREAU-OF-MINES RESEARCH ON SYNTHETIC-LIQUID-FUELS PROCESSES

A substantial contribution to the eventual establishment of an American synthetic-fuels industry is being made by a number of Bureau of Mines research centers which are developing new techniques and improving existing ones for the conversion of solid carboniferous materials to liquid fuels. Of these processes, the direct hydrogenation of coal and lignite, the conversion of coal to synthesis gas (a mixture of carbon monoxide and hydrogen) which forms hydrocarbons in the presence of a catalyst, and the retorting of oil shale are probably economically the most feasible. In addition, the Bureau of Agricultural and Industrial Chemistry is studying methods of producing fuels from agricultural wastes, which may result in a process of future importance to areas where such wastes are concentrated and easily available.

At Rifle, Colorado, new techniques of drilling, blasting, and loading oil shale have been studied, and new mining equipment, ranging in size from drill bits, to special-purpose trucks has been developed. Two 40-ton-capacity, continuous gas flow N-T-U (Nevada-Texas-Utah) retorts have been used for thermally processing the quarried shale. In these retorts, the hot gas is drawn downward through the broken-up shale; and the destructive distillation yields condensable vapors, fixed gases, coke, and spent shale. The characteristics of the products are being studied by Bureau workers at Laramie, Wyoming, where much of the smaller-scale development work is being done and shale oils from several countries are being compared. References to this work can be found in the Annual Reports of the Secretary of the Interior, 1/ as well as in a Bureau of Mines bibliography.2/

1/ Bureau of Mines, Report of Investigations 4457 (1949); Report of Investigations 4652 (1950).

2/ Golumbic, N., Anderson, H. C., and Grass, R. C., Revised Bibliography of Bureau of Mines Investigations on the Production of Liquid Fuels from Oil Shale, Coal, Lignite, and Natural Gas (to 1949); Bureau of Mines, Information Circular 7534 (1949).

By far the most abundant potential source for synthetic fuels is coal. Considerable effort is being expended, therefore, on the study of methods for converting coal to liquid fuels. Thus, the Bureau laboratories at Bruceton, Pa., are making extensive studies of direct and indirect hydrogenation processes utilizing this raw material. In the conventional Bergius process (direct hydrogenation of coal at 300 to 700 atmospheres' pressure and 300° to 500°C.), experimental projects have included a search for suitable catalytic materials, their optimum physical distribution on the coal, and the possibility of utilizing a gas cheaper than pure hydrogen, the cost of which amounts to as much as 50 percent of the total cost of this process. In addition, a considerably modified direct-hydrogenation process has shown that it may be more economical to carry out the liquefaction of coal at about 17 to 67 atmospheres and 500° to 600°C. in a fluidized bed, i.e., with catalyst-impregnated coal particles suspended in a stream of suitable hydrogenating gas. As the result of many bench-scale autoclave studies a preliminary theory concerning the mechanism of coal hydrogenation has been formulated which postulates that coal (or the asphalt produced from it) is thermally split into reactive fragments; the splitting, at least in the case of asphalt, is probably catalyzed by halogen acids. The resulting reactive fragments may polymerize to form benzene-insoluble products, or they may be hydrogenated to soluble products, a reaction catalyzed by tin (or suitable substitutes). The results of these studies, which range from bench-scale to pilot-plant size, are incorporated into the larger-scale studies which are carried out at the demonstration plant at Louisiana, Mo. The literature on the hydrogenation process is voluminous, but a search of the subject is greatly facilitated by the Bibliography of Pressure Hydrogenation,3/ the first part of which has just appeared; parts II (patents) and III (indexes) are to be published shortly.

3/ Wiley, J. L. and Anderson, H. C., Bibliography of Pressure Hydrogenation (in three parts). Part I, Bureau of Mines Bulletin 485 (1950).

Simultaneously with the experimental work on the direct hydrogenation of coal, the Bruceton laboratories are investigating the indirect hydrogenation of coal by way of synthesis gas from which gasoline and Diesel fuels are obtained. In this, the so-called Fischer-Tropsch process, the production of synthesis gas is the most expensive item. Improved coal-gasification methods, which would result in a cheaper synthesis gas, are being sought at the Central Experiment Station, Pittsburgh, Pa.; at Morgantown, W. Va.; and in an underground gasification project at Gorgas, Ala. In the meantime, however, efficient utilization of the synthesis gas is very important. The original fixed-bed Fischer-Tropsch installations with their complicated and costly tubular heat exchangers have become out-dated by processes in which the heat of the exothermic reaction is dissipated by direct contact of the catalyst with cooling liquids or with large volumes of gases in fluidized beds (catalyst particles suspended in synthesis gas). Work at the Bruceton laboratories has centered around relatively low-temperature processes in which iron catalysts are suspended in oil (as fine particles in an oil slurry or as coarser particles in "moving beds"); these processes are operated, generally, at 210° to 260°C. and 20 to 30 atmospheres. Under suitable conditions, the composition of the synthesis gas can be that of the cheapest gas obtainable from coal, and the product distribution (gas, oil, and wax fractions) may be controlled within limits. Investigation of the composition, physical properties, activity, and durability of Fischer-Tropsch catalysts has shown carbided iron catalysts to be more active and more resistant to deterioration than reduced or inducted catalysts. Nitrided catalysts (in which nitrogen, rather than carbon, is introduced into the interstices of iron) have these same advantages to an even greater extent. The products obtained with nitrided catalysts contain more than 60 percent alcohols and thus resemble those of the related Synol process.

A compilation of the literature bearing on the Fischer-Tropsch process and similar to the one cited in footnote 3 is being prepared by the Technical Reports Section of the Bureau of Mines at Bruceton, Pa., where information on all phases of this work can be obtained. A summary of the work at Bruceton is available,[4/] and details of the findings of all pertinent government-sponsored research can be found in the Annual Reports of the Secretary of the Interior on synthetic liquid fuels, which are published as Bureau of Mines Reports of Investigations, and in the List of Publications of the Bureau of Mines (July 1910-January 1949), available from the Government Printing Office at Washington, D. C.

4/ Grass, R. C. and Storch, H. H., "Coal-to-Oil Research at Bruceton, Pa.," Chem. and Eng. News 28, 646-8 (1950).

Prepared by:
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APPAREL

STERILIZATION OF FOOTWEAR TO PREVENT REINFECTION WITH TINEA PEDIS (ATHLETE'S FOOT), by John D. Fulton, Roland B. Mitchell and Charles H. Morhouse. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Nov 1950. 8p photos Mi $1.25, Ph $1.25. PB 102573

1. Mycosis, Cutaneous 2. Footgear, Military - Sterilization 3. AAF SAM Proj 21-35-002, Report no. 1.

Formerly Project no. 21-02-136.

CHEMICAL AND ALLIED PRODUCTS

Drugs and Pharmaceuticals

EFFECTIVENESS OF VARIOUS DRUGS IN PREVENTION OF AIRSICKNESS. III. STUDY OF ADDITIONAL ANTIHISTAMINICS IN AIRPLANE AND SWING, by Herman I. Chinn, Fred W. Oberst and Syrrel S. Wilks. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Aug 1950. 8p tables Mi $1.25, Ph $1.25. PB 102574

1. Airsickness - Remedies 2. Motion sickness - Remedies 3. Antihistamines 4. AAF SAM Proj 21-32-014, Report no. 3.

Formerly Project no. 21-02-169.

EFFECTS OF VARIOUS DRUGS IN PREVENTION OF AIRSICKNESS. I: EFFECTS OF CHEMICAL COMPONENTS OF DRAMAMINE, by Herman I. Chinn and Fred W. Oberst. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Aug 1950. 5p tables Mi $1.25, Ph $1.25. PB 102276

A comparison of the relative effectiveness of dramamine and benadryl in the prevention of airsickness is made. Tables are given and a bibliography is attached. AAF SAM Project 21-32-014 Report 1.

Dyes

PRODUCTION SCHEDULE, DYESTUFFS FACTORY, ANILIN AND SULFUR DYESTUFFS DEPT. INFORMATION BY ITEMS PRODUCED. I. G. Farbenindustrie A. G., Höchst, Ger. Jan 1940-Oct 1946. 82f (Text in German and English) Mi $3.75, Enl Pr $11.25. PB 102705

1. Dyes, Aniline - Manufacture - Germany 2. Dyes, Sulfur - Manufacture - Germany 3. Dyes and dyeing - Manufacture - Germany 4. Acid Fuchsine O (Trade name) 5. Acid Fuchsine extra FB (Trade name) 6. Acid Fuchsine N (Trade name) 7. Alkali blue HE (Trade name) 8. Alkali blue 4 (Trade name) 9. Alkali violet extra A (Trade name) 10. Amidogelb E (Trade name) 11. Astracyanine B (Trade name) 12. Brilliantinde blue 5G (Trade name) 13. Brilliantinde blue 5GL (Trade name) 14. Bronze blue G extra (Trade name) 15. Bronze blue R extra (Trade name) 16. Chromoxane brilliant red BD (Trade name) 17. Chromoxane brilliant red BL (Trade name) 18. Cyanine B (Trade name) 19. Cyanol FFG (Trade name) 20. Cyanol extra (Trade name) 21. Cyanol extra O (Trade name) 22. Cyanol FF (Trade name) 23. Cyanol FF extra (Trade name) 24. Cyanol silk blue (Trade name) 25. Safranine, Diethyl - Germany 26. Methylviolett 3RA extra (Trade name) 27. Fast new blue 3R (Trade name) 28. Methylenblau Ia (Trade name) 29. Methylenblau IaD (Trade name) 30. Methylenblau medicinale (Trade name) 31. Methylenblau 2AM (Trade name) 32. Thioninblau GO (Trade name) 33. Patentblau AF (Trade name) 34. Reflex blue TBK extra (Trade name) 35. Rhoduline heliotrope 3B (Trade name) 36. Soluble blue IN (Trade name) 37. Soluble blue I old (Trade name) 38. Water blue TR (Trade name) 39. R 632 (Trade name) 40. Benzaurine - Germany 41. Pangelb (Trade name) 42. Pinakryptol-gelb (Trade name) 43. Pinakryptol-grün (Trade name) 44. Toluidenblau (Trade name) 45. Rapidfiltergelb (Trade name) 46. Micro BIOS DOCS/2351/1672/1-33 47. Micro BIOS FD 3027/47, Frames 1-82.

Contents: no. 1. Acid Fuchsine O (Trade name: Säurefuchsin O, Säurefuchsin extra FB, Säurefuchsin N). - no. 2. Alkali Blue HE. - no. 3. Alkali Blue 4. - no. 4. Alkali violet extra A. - no. 5. Darstellungsvorschrift für Amidogelb E. - no. 6. Astracyanine B, B. - no. 7. Blue II T-base (Trade name: Blau II-T-base). - no. 8. Blue II, spirit soluble. - no. 9. Brilliantinde blue 5G. - no. 10. Bronze blue G extra in paste. - no. 11. Bronze blue R extra in paste. - no. 12. Chromoxane brilliant red BD. - no. 13. Chromoxane brilliant red BL. - no. 14. Cyanine B. - no. 15. Cyanol FFG. - no. 16. Cyanol extra, Cyanol extra O, Cyanol FF, Cyanol FF extra conc. - no. 17. Cyanol silk blue no. 18. Diethylsafranine crude 100%; Methylene violet 3 RA extra conc. - no. 19. Fast new blue 3R (Trade name: Echineublau 3R). - no. 20. Methylene blue Ia, Methylene blue IaD, Methylene blue Medicinale. - no. 21. Methylene blue 2 AM (Trade name: Thioninblau GO). - no. 22. Patent blue AF. - no. 23. Reflex blue TBK extra - no. 24. Rhoduline heliotrope 3B. - no. 25. Soluble blue IN (Trade name: Wasserblau In f. Lack, Wasserblau In f. Leder, Wasserblau IN, Blau BSW2). no. 26. Soluble blue I old-no. 27. Water blue TR. - no. 28. Vorschrift zur herstellung von farbstoff R632 (Benzaurin). - no. 29. Potassium salt of 2.4 disulfobenzal-2. thioindoxyl (Trade name: Pangelb) - no. 30. Vorschrift zur darstellung von pinakryptol-gelb. - no. 31. Vorschrift zur darstellung von pinakryptol-grün. - no. 32. Vorschrift zur darstellung von Toluidenblau. - no. 33. Vorschrift zur herstellung von Rapidfiltergelb.

Plastics and Plasticizers

PLASTICIZER SDA1, SDA2 AND SDA3 (SULPHODIETHYL AMIDES). I. G. Farbenindustrie A. G., Ludwigshafen, Ger. 1941. 24f (Text in German) Mi $2.00, Enl Pr $5.00. PB 102341

1. SDA1 (Plasticizer) 2. SDA2 (Plasticizer) 3. SDA 3 (Plasticizer) 4. Plasticizers - Germany 5. Amides Sulfo diethyl - Germany 6. KUTEKO (Kunstoff-Technische Kommission) 7. Micro BIOS FD 1735/48, Frames 1-22.

English abstract included. Abstract available as PB 102341s. 2p. Mi $1.25, Ph $1.25. From files of the Kuteko (Technical Plastics Committee).

TEOLAN P, A PLASTICIZER FOR IGELIT (P.V.C.) MASSES. I. G. Farbenindustrie A. G., Ludwigshafen, Ger. 1939. 9f graphs (Text in German) Mi $1.25, Enl Pr $2.50. PB 102342

1. Teolan P (Trade name) 2. Plasticis - Plasticizers - Germany 3. Dynamit-Nobel A.G., Troisdorf, Ger. 4. KUTEKO (Kunstoff-Technische Kommission) 5. Micro BIOS FD 1739/48, Frames 1-8.

English abstract included. Abstract available as PB 102342s. 1p. Mi $1.25, Ph $1.25. Correspondence and test reports from Kuteko (Technical Plastics Committee).

Paints, Varnishes and Lacquers

USE OF A LUMINESCENT LACQUER FOR THE VISUAL INDICATION OF BOUNDARY-LAYER TRANSITION, by Jackson R. Stalder and Ellis G. Slack. U. S. National Advisory Committee for Aeronautics. Jan 1951. 12p Mi $1.75, Ph $2.50. PB 102605

A method is presented for the visual indication of areas of laminar and turbulent boundary-layer flow by a luminescent-lacquer technique. Under ultraviolet irradiation the luminescent lacquer fluoresces with a bright yellow light when dry and reamins dark when wet. Laminar and turbulent boundary layers are indicated by patterns of dark and light areas since the evaporation rates for turbulent boundary layers are greater than for laminar boundary layers. NACA TN 2263.

Chemical Engineering and Equipment

BENZOL, ETHYL BENZOL, STYRENE PLANTS. MONTHLY PRODUCTION REPORTS, JAN 1942-DEC 1944. I. G. Farbenindustrie A. G., Schkopau, Ger. 1942-1944. 262f tables (Text in German) Mi $9.00, Enl Pr $36.25. PB 102396

1. Benzene - Production - Germany 2. Benzene, Ethyl - Production - Germany 3. Styrene - Production - Germany 4. Micro BIOS FD 2166/47, Frames 1-261.

English abstract included. Abstract available as PB 102396s. 1p. Mi $1.25, Ph $1.25.

CRYSTALLIZATION TROUGH IN THE PRODUCTION OF FLUORIDE. Passburg, Emil & Block, Berthold, G.m.b.H., Berlin. Aug 1944. 24f drawings (Text in German) Mi $2.00, Enl Pr $5.00. PB 102388

1. Fluoride - Production - Germany 2. Crystallization - Machinery - Design - Germany 3. Micro BIOS FD 549/48, Frames 1-4.

Some drawings will not reproduce well. For information on the fluorine plant see BIOS FR 1595 (PB 92210). Abstract available as PB 102388s. 1p. Mi $1.25, Ph $1.25.

DESIGN AND DEVELOPMENT OF PLANT AND EQUIPMENT FOR THE SYNTHESIS OF HYDROCARBONS FROM WATERGAS. Lurgi Gesellschaft für Wärmetechnek m.b.H., Frankfort, Ger. 1939-1940. 39f drawings (Text in German) Mi $2.25, Enl Pr $6.25. PB 102370

1. Water gas plants - Germany 2. Water gas - Production equipment - Germany 3. Hydrocarbons - Synthesis - Germany 4. Catalysts, Iron - Germany 5. Catalysts, Cobalt - Germany 6. Micro BIOS FD 3677/47, Frames 1-36.

English abstract included. Abstract available as PB 102370s. 1p. Mi $1.25, Ph $1.25. Includes Report no. 60 on "Two-stage process with Co and Fe catalysts using watergas."

EIN NEUARTIGER KONTAKTTRAEGER AUF MULLITBASIS (NEW TYPE OF CONTACT CARRIER FROM A MULLITE BASIS), by Fridel Hect. Dec 1947. 6p (Text in German and English) Mi $1.25, Ph $1.25. PB 102528

To produce a useable contact carrier which does not have the shortcomings displayed by previous contact carriers, kaolin was prepared with an organic filler and water. The organic filler which was chosen was saw dust impregnated with urea-formaldehyde resin. After forming and drying the kaolin preparation in air, a drying process at about 200°C and then over 500°C is introduced whereby kaolin changes into metakaolin, then, heated to 1000°C (transformation of metakaolin into montmorillonite) and ultimately 1400°C, the final transformation into mullit occurs. Such a contact carrier is of great mechanical perfection and is stable against aqueous solutions up to 300°C even under a pressure of 200 atmospheres. Translated by Rolf Gompertz, QM Intelligence Section, Dec 5, 1947.

PHTHALIC ACID PLANT. TECHNICAL DETAILS, MONTHLY PRODUCTION STATISTICS 1939-1944, AND CORRESPONDENCE. I.G. Farbenindustrie A.G., Schkopau, Ger. 1937-1945. 382f (Text in German) Mi $9.00, Enl Pr $51.25. PB 102397

1. Phthalic acid - Production - Germany 2. Micro BIOS FD 2571/47, Frames 1-380.

English abstract included. Abstract available as PB 102397s. 2p. Mi $1.25, Ph $1.25.

SUBLIMEARAPPARAT (SUBLIMING APPARATUS) SCHEMA DER ESSIG WIEDERGEN (LAY-OUT OF THE VINEGAR RECOVERY PROCESS) SCHEMA DER KAMPSFER-BETRIEB (LAY-OUT OF THE CAMPHOR FACTORY). I.G. Farbenindustrie A.G., Gersthofen, Ger. Feb 1945. 10f drawings only (Legends in German) Mi $1.25, Enl Pr $2.50. PB 102493

1. Machinery - Design - Germany 2. Vinegar - Recovery - Germany 3. Camphor - Preparation - Germany 4. I. G. Farbenindustrie A. G. - Plants - Lay-out - Germany 5. Micro BIOS FD 1003/47, Frames 29-31.

ZUSAMMENFASSUNG DER VERSUCHE ZUR HERSTELLUNG VON BORKARBIDKORPERN (RESUME OF EXPERIMENTS IN FABRICATING BORON CARBIDE COMPACTS). Studiengesellschaft Hartmetall, Berlin. Oct 1940. 2f (Text in German) Mi $1.25, Enl Pr $1.50. PB 102460

1. Boron carbide - Fabrication - Germany 2. BIOS FR 925 LD 3. Micro BIOS HEC 11241 4. Micro BIOS FD 3846/47, Frames 1-2.

Listed in BIOS FR 925 appx. I, p. 23 as HEC 11241.

Miscellaneous Chemicals

AMMONIA SYNTHESIS. AMMONIA CATALYST RICH IN POTASSIUM. Ammoniakwerk Merseburg G.m.b.H., Leuna, Ger. 1937-1948. 38f graphs, tables (Text in German) Mi $2.25, Enl Pr $6.25. PB 102380

1. Ammonia - Synthesis - Germany 2. Ammonia - Catalysts - Germany 3. Micro BIOS FD 26/48, Frames 1-38.

AMMONIAK GEWINNUNG DURCH REKTIFIZIERENDE DESTILLATION VON PHENOLWÄSSERN

(PRODUCTION OF AMMONIA BY RECTIFYING DISTILLATION OF PHENOL-CONTAINING WASTE WATER), BY DIPL.-ING. LUETTGE; 1-JAHR PHENOLOELRAFFINATIONSBETRIEB (ONE YEAR OF PHENOL OIL REFINING), by Dr. Rumschied. Ammoniak werk Merseburg G.m.b.H., Leuna, Ger. 1937-1938. 59f photos, diagr, graphs (Text in German) Mi $2.75, Enl Pr $8.75. PB 102373

1. Ammonia - Recovery - Germany 2. Oils, Phenol containing - Distillation - Germany 3. Phenol - Recovery from waste water - Germany 4. Refineries - Germany 5. Micro BIOS FD 4067/47, Frames 1-57.

English abstract included. Abstract available as PB 102373s. 2p. Mi $1.25, Ph $1.25.

BENZIN-WASSER-EMULSIONEN (GASOLINE-WATER EMULSIONS), by E. Finger. I. G. Farbenindustrie A. G., Oppau, Ger. Feb 1945. 9f (Text in German and English) Mi $1.25, Enl Pr $2.50. PB 102369

1. Emulgator BM-18 (Trade name) 2. Emulsifying agents - Germany 3. Gasoline - Water mixtures - Germany 4. Micro BIOS FD 2867/46, Item 95, Frames 1-5+5.

Kurzbericht nr. 412. Includes English translation and English abstract. Abstract available as PB 102369s 1p. Mi $1.25, Ph $1.25.

CHARACTERISTICS OF DIGLYCOL, TRIGLYCOL, NITRODIGLYCOL AND RELATED CHEMICALS. Westfälische-Anhaltische Sprengstoff A. G., Reinsdorf, Ger. 1935-1944. 35f diagrs, graphs, tables (Text in German) Mi $2.25, Enl Pr $6.25. PB 102364

1. Diethylene glycol - Germany 2. Triethylene glycol - Germany 3. Diethylene glycol nitrate - Germany 4. Micro BIOS FD 2354/46, Frames 2-33.

English abstract included. Abstract available as PB 102364s. 2p. Mi $1.25, Ph $1.25.

COLORED SMOKES, by James Kanegis. U. S. Office of Technical Services. Jan 1951. 11p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.25. PB 102500

1. Smokes, Colored - Bibliography.

CROTONALDEHYDE AND RELATED SUBJECT MATTERS. Deutsche Gold- und Silber-Scheideanstalt, Frankfort, Ger. 1941-1943. 34f diagrs, tables (Text in German) Mi $2.25, Enl Pr $6.25. PB 102379

1. Crotonaldehyde - Production - Germany 2. Micro BIOS FD 10/48, Frames 1-34.

Abstract available as PB 102379s. 3p. Mi $1.25, Ph $1.25. Includes Laboratory reports no. 950, 706, U377.

EINFLUSS VON ALDEHYDEN AUF DIE SPRITAETHYLENREAKTION (INFLUENCE OF ALDEHYDES ON THE ETHYL ALCOHOL-ETHYLENE REACTION), by Dr. W. Müller. I. G. Farbenindustrie A. G., Schkopau, Ger. Oct 1942. 8f drawing, graph, table (Text in German) Mi $1.25, Enl Pr $2.50. PB 102142

1. Ethylene - Catalysts - Germany 2. Aldehydes - Condensation reactions - Germany 3. Acetaldehyde - Condensation reactions - Germany 4. Micro BIOS FD 2617/47, Frames 1-6.

English abstract included. Abstract available as PB 102142s. 2p. Mi $1.25, Ph $1.25.

EMULSION POLYMERIZATION WITHOUT PEROXIDES, BY MEANS OF HYPOCHLORITES OR CHLORAMIDES, by Rohm. I. G. Farbenindustrie A. G., Leverkusen, Ger. Jul 1944. 7f (Text in German) Mi $1.25, Enl Pr $2.50. PB 102445

1. Catalysts, Polymerization - Germany 2. Polymerization, Emulsion - Research - Germany 3. KAUTEKO (Anwendungstechnische Kommission für Kautschuk) 4. Micro BIOS FD 1405/48, Frames 1-6.

English abstract included. Abstract available as PB 102445s. 1p. Mi $1.25, Ph $1.25. Paper submitted to Scientific Rubber Conference July 31, 1944.

KOMPRESSIBILITÄT VON KOHLENWASSERSTOFFEN (COMPRESSIBILITY OF LIQUID AND GASEOUS HYDROCARBONS), by Dr. G. Kling. I. G. Farbenindustrie A. G., Ludwigshafen, Ger. Jul 1943. 8f graphs (Text in German) Mi $1.25, Enl Pr $2.50. PB 102498

1. Hydrocarbons, Gaseous - Compressibility - Germany 2. Hydrocarbons, Liquid - Compressibility - Germany 3. Micro BIOS FD 2867/46, Item 14, Frames 27480-27484.

Abstract available as PB 102498s. 1p. Mi $1.25, Ph $1.25. Kurzbericht des Technischen Profstandes Oppau nr. 31.

KRYPTONGEWINNUNG AUS DEM FLÜSSIGEN SAUERSTOFF DER LINDE-ANLAGE (EXTRACTION OF KRYPTON FROM THE LIQUID OXYGEN OF THE LINDE PLANT), by Wustrow-Wetzel. Ammoniakwerk Merseburg G.m.b.H., Leuna, Ger. Feb 1934. 16f drawings, tables (Text in German) Mi $1.75, Enl Pr $3.75. PB 102374

1. Krypton - Production - Germany 2. Oxygen, Liquid - Fractionation - Germany 3. Micro BIOS FD 4069/47, Frames 1-15.

English abstract included. Abstract available as PB 102374s. 1p. Mi $1.25, Ph $1.25.

PRESCRIPTION FOR THE PRODUCTION OF RAW DISTILLED VANILLIN. DESCRIPTION OF THE PRODUCTION OF ETHYL-VANILLIN. DIACETYL. Riedel, J.D.-E.de Haën A. G., Chemische Fabrik, Selze, Ger. Mar 1946. 15f drawings (Text in English. Legends on drawings in German) Mi $1.75, Enl Pr $3.75. PB 102387

1. Vanillin - Production - Germany 2. Biacetyl - Production - Germany 3. Micro BIOS DOCS 2905/2254/1-3 4. Micro BIOS FD 538/48, Frames 1-9.

Drawings will not reproduce well.

PRODUCTION AT ROOM TEMPERATURE OF PHOSPHATE COATINGS FROM NITRITE-CONTAINING PHOSPHATE BATHS, by Drs. Schuster and Krause. Metallgesellschaft A. G., Frankfort, Ger. Jul 1944. 15f tables (Text in German) Mi $1.75, Enl Pr $3.75. PB 102386

1. Coatings, Phosphate - Germany 2. Micro BIOS FD 304/48, Frames 223-237.

Abstract available as PB 102386s. 2p. Mi $1.25, Ph $1.25.

REPORTS ON METHANOL SYNTHESIS. Deutsche Gold und Silberscheideanstalt, Frankfort, Ger. 1941-1944. 84f drawings, graphs, tables (Text in German) Mi $3.75, Enl Pr $12.50. PB 102212

1. Methanol - Synthesis - Germany 2. Micro BIOS FD 12/48, Frames 1-77.

English abstract included. Abstract available as PB 102212s. 2p. Mi $1.25, Ph $1.25. Reports by Dr. Bayer and Dr. Brendlein.

SWEEPING COMPOUNDS, by James Kanegis. U. S. Office of Technical Services, Jan 1951. 18p tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.25. PB 102311

1. Compounds, Sweeping.

SYNTHESIS AND PURIFICATION OF ALKYLDIPHENYLMETHANE HYDROCARBONS. I: 2-METHYLDIPHENYLMETHANE, 3-METHYLDIPHENYLMETHANE, 2-ETHYLDIPHENYLMETHANE, 4-ETHYLDIPHENYLMETHANE, AND 4-ISOPROPYLDIPHENYLMETHANE, by John H. Lamneck, Jr. and Paul H. Wise. U. S. National Advisory Committee for Aeronautics. Dec 1950. 17p graphs, table Mi $1.75, Ph $2.50. PB 102406

The syntheses of five alkyldiphenylmethane hydrocarbons are described. The preparation of these hydrocarbons was based on the reaction of the appropriate arylmagnesium halides with benzaldehyde to yield the corresponding alkylbenzhydrols which were subsequently converted to the hydrocarbons by hydrogenolysis. The compounds synthesized were 2-methyldiphenylmethane, 3-methyldiphenylmethane, 2-ethyldiphenylmethane, 4-ethyldiphenylmethane, and 4-isopropyldiphenylmethane. The physical properties tabulated include melting point, boiling point, index of refraction, density, viscosity, heat of fusion, and heat of combustion. Time-temperature melting curves are plotted for all compounds prepared. NACA TN 2230.

SYNTHESIS OF CYCLOPROPANE HYDROCARBONS FROM METHYLCYCLOPROPYL KETONE. I: 2-CYCLOPROPYLPROPENE AND 2-CYCLOPROPYLPROPANE, by Vernon A. Slabey and P. H. Wise. U. S. National Advisory Committee for Aeronautics. Jan 1951. 17p Mi $1.75, Ph $2.50. PB 102604

The preparation of 2-cyclopropylpropene and 2-cyclopropylpropane from methylcyclopropyl ketone is described. The synthesis involves the reaction of methylmagnesium chloride with methylcyclopropyl ketone to yield dimethylcyclopropylcarbinol, the dehydration of the carbinol to 2-cyclopropylpropene, and the hydrogenation of the olefin to 2-cyclopropylpropane. The following properties of the hydrocarbons were determined: melting point, boiling point, index of refraction, density, and net heat of combustion. The infrared spectra of 2-cyclopropylpropene, 2-cyclopropylpropane and methylcyclopropyl ketone are presented. For pt. 2 see PB 102565. NACA TN 2258.

SYNTHESIS OF CYCLOPROPANE HYDROCARBONS FROM METHYLCYCLOPROPYL KETONE. II. 2-CYCLOPROPYL-1-PENTENE, CIS AND TRANS 2-CYCLOPROPYL-2-PENTENE AND 2-CYCLOPROPYLPENTANE, by Vernon A. Slabey and P. H. Wise. U. S. National Advisory Committee for Aeronautics. Jan 1951. 20p graphs, tables Mi $1.75, Ph $2.50. PB 102565

The hydrocarbons, 2-cyclopropyl-1-pentene, cis and trans 2-cyclopropyl-2-pentene, and 2-cyclopropylpentane were synthesized in high purity and their physical properties and infrared spectra were determined. The olefins were isolated from the dehydration products of methyl-n-propylcyclopropylcarbinol, which was prepared by the reaction of n-propylmagnesium bromide with methylcyclopropyl ketone. Catalytic hydrogenation of the 2-cyclopropylpentenes yielded 2-cyclopropylpentane. For pt. 1 see PB 102604. NACA TN 2259.

"TRIPEN" (HEXACHLOROBUTENE). Steinkohlenbergwerk Rheinpreussen, Meerbeck, Ger. 1939-1940. 4f graph, table (Text in German) Mi $1.25, Enl Pr $1.50. PB 102381

1. Tripen (Trade name) 2. Florex E (Trade name) 3. Butene, Hexachloro - Germany 4. Micro BIOS FD 33/48, Frames 1-4.

Abstract available as PB 102381s. 1p. Mi $1.25, Ph $1.25.

VERSUCHE ZUR ABTRENNUNG VON WOLFRAMSÄURE ALS AMONIUMPARAWOLFRAMAT AUS NATRIUM-WOLFRAMATLÖSUNGEN (EXPERIMENTS ON THE SEPARATION OF TUNGSTIC ACID IN THE FORM OF AMMONIUM PARATUNGSTATE FROM SODIUM TUNGSTATE SOLUTIONS), by Dr. Dawihl. Studiengesellschaft Hartmetall, Berlin. Jan 1941. 3f (Text in German) Mi $1.25, Enl Pr $1.50. PB 102470

1. Ammonium tungstate - Production - Germany 2. BIOS FR 925 LD 3. Micro BIOS HEC 11262 4. Micro BIOS FD 3858/47, Frames 1-2.

English abstract included. Abstract available as PB 102470s. 1p. Mi $1.25, Ph $1.25. Listed in BIOS FR 925 appx. I, p. 25.

DETERIORATION STUDIES

LECTURES ON TROPICALIZATION, COMPILED AND EDITED BY INSPECTION MANUAL SUBSECTION, QUALITY CONTROL DIVISION. U. S. Signal Corps Engineering Laboratories, Fort Monmouth, N. J. Nov 1944. 46p graphs, table Mi $2.50, Ph $6.25. PB 102671

1. Tropicalization 2. Plastics - Tropical deterioration 3. Coatings, Corrosion resistent 4. Specification 71-2202-A.

Contents: Graphs and tests, by Seymour Hyman- Application of specification 71-2202-A, by Hal M. Parshall. - Tropicalization of materials not covered by specification 71-2202-A, by Seymour Hyman- History of field application by M. B. Kraus. - Plastics, by Natcho Vasileff. - Corrosion-protective finishes, by Floyd Helrigel. - Selection of components, (electrical indicating instruments) by Jack S. Gantt. - Selection of components, by Hal M. Parshall.

ELECTRICAL MACHINERY, EQUIPMENT AND SUPPLIES

Communication Equipment

CONSOL, A RADIO AID TO NAVIGATION, A BRIEF DESCRIPTION OF ITS USE, WITH DETAILS OF THE SERVICE AND COVER PROVIDED BY EXIST-

ING STATIONS. Gt. Brit. Ministry of Civil Aviation. Oct 1950. 23p diagrs (part fold), tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 102330

1. Navigational aids - Gt. Brit. 2. Radio beacons - Gt. Brit. 3. MCA P 59.

S. O. Code no. 22-180-0-50. Second edition.

THE MEASUREMENT OF FLUCTUATING RADIATION COMPONENTS IN THE SKY AND ATMOSPHERE. PART 2: FINAL RESULTS AND THEIR APPLICATION TO OPTICAL COMMUNICATION, by Emmanuel Goldstein. U. S. Naval Research Laboratory. Jul 1950. 45p photos, graphs, map Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $1.25. PB 102617

Further measurements and results have been obtained in the program of investigating fluctuating radiation components in the sky and atmosphere. Additional measuring equipment has been constructed and is also described. Equations are derived to allow the calculation of the effect of the measured fluctuations in incident radiation on a typical amplitude modulated optical communication system. For pt. 1 see PB 99175. NRL R 3710.

SURVEY OF THE RESEARCH LITERATURE COMPARING THE VISUAL AND AUDITORY PRESENTATION OF INFORMATION, by Willard F. Day and Barbara Beach. Virginia. University. Dept. of Psychology. Nov 1950. 17p Mi $1.75, Ph $2.50. PB 102410

1. Communications, Auditory - Bibliography 2. Communications, Visual - Bibliography 3. U. S. Air Materiel Command, Wright-Patterson Air Force Base, Dayton, Ohio 4. AAF TR 5921.

Contract W33-038-ac-21269. E.O. 694-37.

Electronics

DEVELOPMENT OF PRINTED ELECTRONIC CIRCUITS: FINAL ENGINEERING REPORT. Kenyon Instrument Co., Inc., Huntington Station, New York. Mar 1949. 12p photos, tables Mi $1.75, Ph $2.50. PB 102548

1. Resistors, Consistent printed 2. Coatings, Carbonyl nickel 3. Circuits, Electronic - Printed 4. Electronic metals - Coatings 5. SIG Contract W36-039-sc-33659.

Summarizing previous reports and covering period for contract extension December 15, 1948 to February 15, 1949. Contract W36-039-sc-33659. Army project 3-26-00-600. Signal Corps project 2006.

DISTANT FIELD OF AN ARBITRARY SLOT ANTENNA IN THE SURFACE OF A CYLINDER, by George Sinclair. Ohio State University Research Foundation. Antenna Laboratory, Columbus, Ohio. Sep 1949. 22p diagrs, graphs Mi $2.00, Ph $3.75. PB 102544

The distant field radiated by an arbitrary slot on the surface of a cylinder is determined from a knowledge of the field distribution in the opening of the slot. This theoretical analysis of the polarization for an arbitrary orientation of the slot is of interest in the development of antennas for circular polarization and their required antenna parameters. Explicit formulas for the distant field, radiated by an elementary area of the current sheet, can be obtained if the boundary conditions on the surface of the cylinder are satisfied. An integration over the known current distributions in the opening of the slot yields the pattern for the slot. Project report 301-17. Contract W33-038-ac-16520 (17380).

ELECTRONIC EQUIPMENT CONSTRUCTION: NEW OBJECTIVES - NEW TECHNIQUES - NEW COMPONENTS. TERMINAL REPORT COMPILED by M. B. Adams and others. Stanford Research Institute, Stanford, California. Jun 1950. 308p photos, diagrs graphs, tables (3 fold) Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $7.00. PB 101745

1. Electronic equipment - Installation 2. U. S. Office of Naval Research 3. SRI Proj 195.

Phase I, Task order no. 3, Contract N7onr-32103 placed by Office of Naval Research, Washington, D. C.

FACTORS INFLUENCING GENERATION OF AND SUSCEPTIBILITY TO INTERFERENCE VOLTAGES BY ELECTRONIC EQUIPMENT. FINAL ENGINEERING REPORT MAY 20, 1948 THROUGH NOVEMBER 20, 1949. General Laboratory Associates, Inc., Norwich, N. Y. Nov 1949. 178p diagrs, drawings, graphs, tables Mi $6.50, Ph $22.50. PB 102543

1. Electronic equipment - Voltage interference 2. Interference, Electrical.

Serial 44. Contract W 33-038-ac-21149. Contents: - Section I. Interference free design. p. 4-10. Section II. Non-susceptible design. p. 11-117. Section III. Methods of specifying and testing for susceptibility. p. 118-178.

HIGH-FREQUENCY ULTRASONICS, I: 75 TO 280 MC/SEC, by Robert A. Rapuano. Massachusetts Institute of Technology. Research Laboratory of Electronics, Cambridge, Mass. Jun 1949. 15p photos, diagrs, graphs, tables Mi $1.75, Ph $2.50. PB 102189

The determination of ultrasonic absorption in liquids and solids by pulse-echo methods in the frequency range of 75 megacycles, to 280 megacycles is discussed. The equipment employed consisted mainly of a transducer, a transmitter, a receiver, and a reflector, A Q-meter was useful in determining quartz crystal characteristics such as resonance frequencies, bandwidth, impedance, coupling to cross-modes, and efficiency of transduction as a function of frequency. Data from measurements of various liquids show that, within experimental error the value of α/f^2 is found constant for each liquid examined. There was, in general, good agreement with work at lower frequencies. Also an approximately constant value of α/f up to 200 megacycles for attenuation measurements of fused quartz was shown to agree with the value given by Mason. MIT RLE TR 107.

INITIAL STUDIES OF A HARMONIC OUTPUT WIDE-TUNING TRAVELING-WAVE TUBE OSCILLATOR, by L. M. Field. Stanford University. Electronics Research Laboratory, Stanford, Calif. Sep 1949. 39p photos, drawings (1 fold), graphs, tables Mi $2.25, Ph $5.00. PB 102545

Initial studies of a harmonic output wide-tuning traveling-wave tube oscillator were initiated to extend 4000-megacycle traveling wave tube concepts

to the 10,000 and 20,000 megacycle region. Feedback circuits were used to give continuously variable oscillation frequencies of 7,500 to 11,750 megacycle fundamental output at a power of about 50 mw and a harmonic output of 15,000 to 23,500 megacycle at about 1 mw level. The construction details of these tubes and developments relating to the tubes are furnished. Also, a lower-frequency oscillator of the same type is described, and special attention is paid to problems of uncontrolled oscillations. Contract N6-ONR-251, consolidated task no. 7 (NR-078-360). SU ERL TR 20.

L-, S-, AND X-BAND RADAR ECHOES FROM RIFLE SHELLS, by Frank C. Macdonald. U. S. Naval Research Laboratory. Aug 1950. 29p photo, graphs, tables Mi $2.00, Ph $3.75. PB 102616

Measurements of the radar cross section, σ, of rifle shells (diameters: 5", 6", 8", 12", 16") were attempted at L-, S-, and X-band. Most of the measured values of σ at L- and S- band fell within the range 2×10^{-4} to 2×10^{-2} square meters. At X-band no echoes were visible, probably because of the inherently lower sensitivity of the X-band system. The pulse-to-pulse fluctuations of the echo were very small, the average fluctuation being of the order of 2 decibels. NRL R 3720.

QUARTERLY REPORT, 1ST, ON CONTRACT NO. W-36-039-SC-38200 MODIFICATION NO. 2, by Dr. Clifford Frondel and Richard Collette. Baird. Associates, Inc., Cambridge, Mass. Jun 1949. 5p drawing Mi $1.25, Ph $1.25. PB 102231

1. Tourmaline - Synthesis 2. Boracite - Synthesis 3. Crystals, Tourmaline 4. Crystals, Piezoelectric - Research 5. SIG Contract W-36-039-sc-38200 Report 1.

Dept. of the Army Project: 33-99-11-022. Signal Corps project: 37-142B. Report J.O. 5055. Continues work done on Contract W-36-039-sc-32153. For 2d report see PB 102232; for 3d and final report see PB 102233.

QUARTERLY REPORT, 2D, ON CONTRACT NO. W-36-039-SC-38200 MODIFICATION NO. 3, by Dr. Clifford Frondel and Richard Collette. Baird Associates, Inc., Cambridge, Mass. Sep 1949. 8p Mi $1.25, Ph $1.25. PB 102232

1. Tourmaline - Synthesis 2. Boracite - Synthesis 3. Crystals, Tourmaline 4. Crystals, Piezoelectric - Research 5. SIG Contract W-36-039-sc-38200 Report 2.

Dept. of the Army project: 33-99-11-022. Signal Corps project: 37-142B. Report J.O. 5055. For 1st report see PB 102231; for 3d and final report see PB 102233.

RESEARCH AND DEVELOPMENT OF ATTENUATORS OVER THE FREQUENCY RANGE OF 10,000 MC/SEC TO 33,000 MC/SEC, BY ANTHONY B. GIORDANO. POLYTECHNIC INSTITUTE OF BROOKLYN. MICROWAVE RESEARCH INSTITUTE, BROOKLYN, N. Y. INTERIM REPORT FOR FEBRUARY, 1947. Mar 1947. 15p drawings, graphs Mi $1.75, Ph $2.50. PB 102501

Progress made during February 1947 on research and development of attenuators for wave guide transmission systems for operation over the frequency range of 10,000 to 33,000 mcps, is outlined. Work was concerned with the design of an attenuator for wave guide size 1/2 x 1/4 x 0.40 in., calibration of sensitivity control for attenuation measurements above 25 db (10,000 - 12,650 mcps) using a harmonic generator for wave guide size 1 x 1/2 x .050 in., and experiments to determine the optimum range of operation of crystal mixers for linear detection. A 160 ohms/square glass plate coated on both sides with nichrome appears to have promising attenuation characteristics for the 1/2 x 1/4 x. 040 in. wave guide attenuator. The minimum ratio of local oscillator power level to signal power level for linear mixing is 40 and appears to be independent of the absolute power levels. A ratio of 80 should be used to assure linear mixing in the IN23B crystal. Progress report for the month of February 1947, Contract WLENG W28-099-ac-197. Retyped from non-reproducible copy by Central Air Documents Office, Intelligence Department, Air Materiel Command, Wright-Patterson Air Force Base, Dayton, Ohio. Drawings and graphs will not reproduce well. PIB R-125.9-47. PIB 76.9.

RESISTIVE DIRECTIONAL COUPLER FOR WAVEGUIDE, by Morton S. Tanenbaum. Polytechnic Institute of Brooklyn. Microwave Research Institute, Brooklyn, N. Y. Sep 1949. 43p diagrs, drawings, tables Mi $2.50, Ph $6.25. PB 102547

In ultrahigh radio frequency microwave antenna feeder systems it often becomes necessary to measure the standing wave pattern in the transmission line. A directional coupler is described which is used to reproduce the wave pattern of the main line in an auxiliary line. This avoids the necessity of altering the feeder in many applications. The theory includes coupling characteristics of a resistive film in the broad wall common to two wave guides. The theory is compared with experimental results and the possible sources of error are evaluated. A coupler model is presented which experimentally indicates a high directivity and constant coupling over a wide frequency band. Contract W33-038-ac-18115. PIB R-225-49. PIB 170.

SERVICES, FACILITIES, AND MATERIALS REQUIRED TO CONDUCT RESEARCH INVESTIGATION OF EQUIPMENT AND TECHNIQUES OF CRYSTALS. FINAL REPORT ON CONTRACT W36-039-SC-38200 MODIFICATION NO. 3, COVERING PERIOD MAR 2, 1949 TO DEC 1, 1949, by Clifford Frondel and Richard L. Collette. Baird Associates, Inc., Cambirdge, Mass. Feb 1950. 55p photos, drawings, tables Mi $2.75, Ph $7.50. PB 102233

1. Tourmaline - Synthesis 2. Boracite - Synthesis 3. Crystals, Tourmaline 4. Crystals, Piezoelectric - Research 5. SIG Contract W-36-039-sc-38200 Report 3.

Dept. of the Army Project: 33-99-11-022. Signal Corps project: 37-142B. For 1st-2d reports see PB 102231-102232.

SHOT NOISE IN BEAM TYPE TRAVELING-WAVE AMPLIFIERS, by L. D. Smullin. Massachusetts Institute of Technology. Research Laboratory of Electronics, Cambridge, Mass. Oct 1949. 12p Mi $1.75, Ph $2.50. PB 102191

The noise figure is computed for beam type traveling-wave amplifiers, considering only shot noise arising from the random emission of electrons from

the cathode. Expressions are derived for the actual noise current and the noise velocity fluctuations in the beam at the beginning of the helix, and the power induced in the growing wave is compared with that due to thermal noise. The noise figure for the traveling wave amplifier is found to be inversely proportional to the gain parameter, such that there is little or nothing to be gained by building tubes to operate at very low voltage. It appears that the best tubes will have small helix and small beam diameters. MIT RLE TR 142.

THERMIONIC EMISSION FROM OXIDE CATHODES: RETARDING AND ACCELERATING FIELDS, by C.S. Hung. Massachusetts Institute of Technology. Research Laboratory of Electronics, Cambridge, Mass. Jul 1949. 17p diagr, graphs Mi $1.75, Ph $2.50. PB 102187

The thermionic emission from oxide-coated cathodes in which the applied voltage range extends from the retarding potential region through zero field and up to an average accelerating field of 50,000 v/cm was investigated experimentally. The retarding potential range yields information concerning energy distribution of emitted electrons, and indicates an excellent agreement between theory and experiment for high retarding fields. Results show in the accelerating field region up to 50,000 v/cm are accounted for by the patch effect for small accelerating fields, and by the intensification of the field at sharp points (due to roughness of cathodes used. Any deviation of experimental results from those of the Schottky mirror image theory is explained by the above two assumptions. MIT RLE TR 131.

Generators, Motors, Transmission Distribution, and Allied Equipment

FINAL REPORT ON THE CONTACT CONVERTER, SUBMITTED TO U. S. NAVY, BUREAU OF SHIPS CONTRACT NOBS 28577, by Otto Jensen. I-T-E Circuit Breaker Co., Philadelphia, Pa. 1948. 241p photos, drawings, diagrs, graph Mi $9.00, Ph $31.25. PB 102111

This report summarizes all available information. Summarizes all information available. See also FIAT FR 920 (PB 80929-80933), PB 101977.

Miscellaneous

ADDRESSES AT THE DEDICATION OF THE NOL X-RAY LABORATORY AND AT THE SYMPOSIUM ON NON-DESTRUCTIVE TESTING, 24-25 MARCH 1949. U. S. Naval Ordnance Laboratory. Jul 1950. 137p photos, drawings, diagrs, graphs Mi $5.50, Ph $17.50. PB 102028

1. Laboratories, X-ray 2. X-ray research 3. Betatrons 4. Non-destructive tests 5. NOLR 1147.

Contents: Part I. Dedication ceremonies: Welcome by Rear Admiral F. E. Beatty. - Mission and charge, by C. S. Piggott. - Response by R. D. Bennett. - Naval Ordnance Laboratory X-ray facility, by D.T. O'Connor. Part II. X-rays in science and industry: Development of the mobile betatron, by F. W. Westendorp. - Developments in electronic X-ray fluoroscopy, by F. H. Marshall. - Electrostatic generators for X-rays, by D. Robinson. - X-ray cinematograph, by C. M. Slack. - X-rays in national defense, by L. W. Ball. Part III. Non-destructive testing in manufacture and inspection: Application of non-destructive testing by the steel casting industry, by C. W. Briggs. - Application of non-destructive testing by the welding industry, by O. R. Carpenter. - Application of non-destructive testing by the magnesium industry, by J. C. McDonald. - Adaptation of non-destructive testing procedures to mass production quantity inspection, by J. J. Pierce. - Part IV. Current military applications of non-destructive testing: Army Ordnance Department activity, by H. H. Lester. - Bureau of ships activity, by CDR R. H. Lambert. - Bureau of Aeronautics activity, by N. E. Promisel. - U. S. Air Force activity, by J. C. McGee. - Naval Ordnance activity, by T. K. Chatham.

AGING CHARACTERISTICS OF ELECTRICAL INSULATION, by R. E. Whipple. U. S. Naval Research Laboratory. Jul 1950. 13p photos, diagr, graphs, table Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.50. PB 102619

A procedure has been developed for determining aging characteristics of insulation by means of specimen coils wound and subjected to those stresses experienced by motor windings. It provices means for checking all factors which influence insulation life such as temperature, dielectric and mechanical stresses, and contaminants. By employing this method, aging characteristics have been obtained for Class A insulation. The results depart sufficiently from the "10-degree rule" to render this empirical relation inapplicable below one thousand hours of life. NRL R 3708.

BEARBEITUNG VON WOLFRAMELEKTRODEN DURCH ELEKTROLYTICHAETZEN (SHAPING OF TUNGSTEN ELECTRODES BY ELECTROLYTIC ETCHING) ANSPITZEN VON STAHLNADELN DURCH ELEKTROLYTISCHES AETZEN (SHARPENING OF STEEL NEEDLES BY ELECTROLYTIC ETCHING), by Bergmann. Studiengesellschaft Hartmetall, Berlin. Aug-Nov 1940. 3f (Text in German) Mi $1.25, Enl Pr $1.50. PB 102468

1. Etching, Electrolytic - Germany 2. Electrode Tungsten - Shaping - Germany 3. Needles, Steel - Sharpening - Germany 4. BIOS FR 925 LD 5. Micro BIOS HEC 11238 6. Micro BIOS HEC 11251 7. Micro BIOS FD 3856/47, Frames 1-3

BYGGNADSTEKNISK LJUSEKONOMI (ECONOMICS OF INTERIOR LIGHTING WITH SPECIAL REFERENCE TO BUILDING CONSTRUCTIONS) av Harry Kreuger. Sweden. Statens Kommittee för Byggnadsforskning. 1950. 116p drawing, graphs, tables (Text in Swedish) Mi $4.75, Ph $15.00. PB 102020

1. Lighting, Artificial - Sweden 2. Lighting, Industrial - Sweden 3. Sweden. Statens Kommittee för Byggnadsforskning. Meddelanden 18.

Summary in English.

STUDY OF TUBULAR SHIELDING. FINAL REPORT VOL. 1 ON CONTRACT NO A(S)-8098 BETWEEN BUREAU OF AERONAUTICS, U. S. NAVY, AND AMERICAN BRASS CO., AMERICAN METAL HOSE BRANCH, WATERBURY, CONN. Technicraft Laboratories, Inc., Thomaston, Conn. Jun 1948. 251p photo, graphs, diagrs, table Mi $9.00, Ph $32.50 PB 102655

1. Shielding, Electromagnetic 2. Conduits, Electric 3. American Brass Co., American Metal Hose Branch, Waterbury, Conn.

Includes 1st-3rd Technical reports. For. v. 2 see PB 99517.

FOOD AND KINDRED PRODUCTS

PREPARATION OF BUTTERMILK IN THE CONTINUOUS CHURNING PROCESS ACCORDING TO THE SEPARATOR METHOD (ALFA-PROCEDURE), by W. Mohr and E. Mack. 1944. 11f Mi $1.75, Enl Pr $3.75. PB 102343

1. Buttermilk - Preparation - Germany 2. Alfa process - Germany 3. BIOS OR 19 LD 4. Micro BIOS FD 1762/48, Frames 1-9.

English abstract included. Abstract available as PB 102343s. 2p. Mi $1.25, Ph $1.25. Translation from Deutsche molkerei- und fettwirtschaft 39/41, 1944. Listed in BIOS Miscellaneous report 19, p. 343, item 48.

REFRIGERATED GAS STORAGE OF APPLES, by Franklin Kidd and Cyril West. Gt. Brit. Dept. of Scientific and Industrial Research. Food Investigation Board. Revised. 1950. 15p graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.15. PB 102443

Since there is a definite limit to the temperature used for the long-period storage of many of the most valuable varieties of apples, an alternative means of retarding the ripening of the fruit was sought. The research workers of the Food Investigation Organization developed a storage method in which control of the composition of the atmosphere in the store is the principal feature. However, since control of temperature is also essential, the method is described as refrigerated gas storage. A bibliography is included. S.O. Code no. 47-156-6. DSIR FI L6.

SOUTH AFRICAN SUGAR INDUSTRY-REVIEW, by A. J. Norval, P. L. Kriek, A. A. Moore, S. Viljoen, H. A. Levy. Union of South Africa. Board of Trade and Industries. Feb 1947. 160p tables (part fold) Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.00. PB 102122

1. Sugar industry - Union of South Africa. Report no. 298.

FUELS AND LUBRICANTS

ANALYSIS METHODS AND PROCESSING DIRECTIVES FOR THE A-DEPARTMENT (ACETYLENE-ALDEHYDE). I. G. Farbenindustrie A. G., Schkopau, Ger. 1935-1944. 122f (Text in German) Mi $5.00, Enl Pr $17.50. PB 102362

1. Acetylene - Production - Germany 2. Aldehydes - Production - Germany 3. Chemical compounds, Organic - Analysis - Germany 4. Micro BIOS FD 2023/47, Frames 1-120.

English abstract included. Abstract available as PB 102362s. 2p. Mi $1.25, Ph $1.25.

APPLICATION, RECLAMATION, AND RE-REFINING OF USED AUTOMOTIVE CRANKCASE OILS. U. S. Office of Technical Services. Nov 1950. 13p Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. $.25. PB 102130

1. Lubricating oils - Refining 2. Waste - Utilization.

BERICHT ÜBER DIE TAGUNG "KLOPFVERHALTEN UND LAGERUNG VON KRAFTSTOFFEN" AM 16. UND 17. JUNI 1941 IN BERLIN-ADLERSHOF (REPORT ON THE CONFERENCE ON KNOCKING AND SEDIMENTATION OF FUELS). Deutsche Versuchsanstalt für Luftfahrt, E. V., Berlin. Institut für Betriebsstofforschung. Jun 1941. 181f photos, drawings, graphs (Text in German) Mi $6.75, Enl Pr $25.00. PB 102398

1. Fuels, Aviation - Knocking - Germany 2. Micro BIOS FD 2876/46, Item 93, Frames 1-181.

COLORIMETRIC METHOD FOR THE DETERMINATION OF THIOPHENE IN SYNTHESIS GAS, by H. W. Wainwright and G. I. Lambert. U. S. Bureau of Mines. Nov 1950. 19p graphs Mi $1.75, Ph $2.50. PB 102352

1. Thiophene - Analysis 2. Gas - Synthesis 3. Colorimetry 4. BM RI 4753.

CONTROL OF TECHNICAL OPERATIONS IN THE FISCHER-TROPSCH SYNTHESIS. Steinkohlenbergwerk Rheinpreussen, Homberg, Ger. 1938-1942. 283f photos, drawings, graphs (Text in German) Mi $9.00, Enl Pr $38.75. PB 102382

1. Fischer-Tropsch process - Germany 2. Furnaces, Catalyst - Design - Germany 3. Fuels, Synthetic - Production - Germany 4. Micro BIOS FD 42/48, Frames 1-278.

Abstract available as PB 102382s. 1p. Mi $1.25, Ph $1.25.

DEALCOHOLIZATION OF HYDROCARBON-ALCOHOL MIXTURES BY TREATING WITH SOAP SOLUTIONS. Ruhrchemie A. G., Oberhausen-Holten, Ger. 1942-1943. 37f photos, diagrs, graphs, tables (Text in German) Mi $2.25, Enl Pr $6.25. PB 102399

1. Alcohols - Extraction from Diesel oil - Germany 2. Oils, Diesel - Dealcoholization - Germany 3. Soap solutions - Germany 4. Alcohol mixtures - Dealcoholization - Germany 5. Micro BIOS FD 5430/47, Frames 1-37.

Abstract available as PB 102399s. 2p. Mi $1.25, Ph $1.25. Includes two reports by Buechner on separation of hydroxylated compounds and of oxo-alcohols from Diesel oils by means of soap solutions.

FLOW CHARACTERISTICS OF GAS LIFT IN OIL PRODUCTION, by S. F. Shaw. Texas. Engineering Experiment Station, College Station, Texas. Jul 1947 90p photos, diagrs, graphs, tables Available from Texas Engineering Experiment Station, College Station, Texas PB 102309

The air lift research project described in this bulletin was undertaken for the purpose of determining the productive capacities of four diameters of flow pipe of various lengths when lifting water and oil by means of air lift. Agricultural and Mechanical College of Texas. Bulletin, ser. 5, v. 3, no. 7, Jul 1, 1947. TU EES B 113.

INVESTIGATION OF 75-MILLIMETER-BORE CYLINDRICAL ROLLER BEARINGS AT HIGH SPEEDS. II: LUBRICATION STUDIES - EFFECT OF OIL-INLET LOCATION, ANGLE, AND VELOCITY FOR SINGLE-JET LUBRICATION, by E. Fred Macks and Zolton N. Nemeth. U. S. National Advisory Committee for Aeronautics. Nov 1950. 36p drawings, graphs, table Mi $2.25, Ph $5.00.
PB 102252

Studies at constant oil-inlet temperature, including effect of oil-inlet location, angle, and velocity for single-jet lubrication, were conducted at high speeds using 75-millimeter-bore cylindrical-roller bearings. Ranges of controlled variables were: load, 113 and 368 pounds; DN (bore x speed), 0.3 x 10^6 to 1.43 x 10^6; oil flows, 0.6 to 12.9 pound per minute, oil inlet velocities, 13 to 200 feet per second. Inner- and outer-race bearing temperatures (a) were minimum when oil was directed at cage-locating surface, normal to bearing face, and (b) decreased with oil inlet velocity at a given flow. Differences between the inner-race and oil-inlet temperatures were correlated by heat-transfer theory with oil flow, oil-jet diameter, and DN to give a single curve for a given load and oil inlet temperature. NACA TN 2216.

MANUFACTURE OF IRON CATALYSTS AND THEIR EMPLOYMENT IN THE FISCHER-TROPSCH SYNTHESIS. Ruhrchemie A. G., Oberhausen-Holten, Ger. 1940-1944. 423f drawings, graphs, tables (Text in German) Mi $9.00, Enl Pr $56.25. PB 102383

1. Fischer-Tropsch process - Germany 2. Gasol (Trade name) 3. Iron-Catalysts - Germany 4. Micro BIOS FD 76/48, Frames 1-418.

Abstract available as PB 102383s. 2p. Mi $1.25, Ph $1.25.

NEUE ERKENNTNISSE ÜBER DIE SCHMIERFÄHIGKEIT UND IHRE MESSUNG (NEW STUDIES ON LUBRICATING CAPACITY AND ITS MEASUREMENT), by Johannes Kluge. May 1942. 44f graphs (Text in German and English) Mi $2.50, Enl Pr $7.50.
PB 102499

1. Lubrication - Research - Germany 2. Piston rings - Lubrication - Germany 3. Lubricating oils - Testing equipment - Germany 4. Germany. Physikalisch-Technische Reichsanstalt 5. Gt. Brit. Ministry of Supply 6. Micro GDC 10/10314aT 7. Micro BIOS FD 2871/46, Item 62, Frames 1-19+25.

Translation and original German text from Mitteilungen der Deutschen Akademie der Luftfahrtforschung no. 6, p. 299-313. Abstract available as PB 102499s. 2p. Mi $1.25, Ph $1.25.

NOTES ON ETHYL BENZENE AND DERIVATIVES (KYBOL). I. G. Farbenindustrie A. G., Schkopau, Ger. 1941-1944. 55f (Text in German) Mi $2.75, Enl Pr $8.75. PB 102426

1. Kybol (Trade name) 2. Benzene, Ethyl - Derivatives - Germany 3. Benzene, Hexaethyl - Production - Germany 4. Butylene - Production - Germany 5. Fuels, Aviation - Production - Germany 6. Micro BIOS FD 2171/47, Frames 1-54.

English abstract included. Abstract available as PB 102426s. 1p. Mi $1.25, Ph $1.25.

PRODUCTION OF ACETYLENE BY ARC-LIGHT PROCESS. I. G. Farbenindustrie A. G., Ludwigshafen, Ger. 1934-1943. 308f diagrs, tables (Text in German and English) Mi $9.00, Enl Pr $41.25.
PB 102425

1. Acetylene - Production - Electric arc process - Germany 2. Micro BIOS FD 5/48, Frames 1-298.

English abstract included. Abstract available as PB 102425s. 2p. Mi $1.25, Ph $1.25.

PRODUCTION OF AMMONIA AND HYDROGENATION OF COAL. I. G. Farbenindustrie A. G., Ludwigshafen, Ger. 1937-1943. 282f drawings, diagrs, graphs, tables (Text in German) Mi $9.00, Enl Pr $37.50.
PB 102428

1. Ammonia - Production - Germany 2. Coal - Hydrogenation - Germany 3. Coal tar - Hydrogenation - Germany 4. Micro BIOS FD 3547/47, Frames 1-253

English abstract included. Abstract available as PB 102428s. 3p. Mi $1.25, Ph $1.25.

PRODUCTION OF LUBRICATING OILS FROM BROWN COAL TAR. Berlin. Technische Hochschule. Institut für Braunkohlen und Mineralölforschung. 1941-1944. 79f graphs, tables (Text in German) Mi $3.50, Enl Pr $11.25. PB 102094

1. Lubricating oils - Production - Germany 2. Micro BIOS FD 2872/46, Item 91-93, Frames 1-73.

English abstract included. Abstract available as PB 102094s. 2p. Mi $1.25, Ph $1.25. Includes report no. 92/1941 by Marder and Mertz, report no. 109/1942 by Marder and Feichtinger, report no. 120/1944 by Heinze.

PRÜFUNG EINES NACH VERSCHEIDENEN VERFAHREN GEWASCHENEN SCHWELKOKSES IM FAHRZEUGGENERATOR (TESTING OF GENERATOR COKE WASHED BY VARIOUS METHODS), by L. Koehler. I. G. Farbenindustrie A. G., Ludwigshafen, Ger. Jun 1943. 16f photos, diagrs, tables (Text in German) Mi $1.75, Enl Pr $3.75. PB 102496

1. Coal - Washing - Germany 2. Coke - Properties - Germany 3. Tromp method (Coal washing) 4. Micro BIOS FD 2866/46, Item 64, Frames 1-16.

Abstract available as PB 102496s. 1p. Mi $1.25, Ph $1.25. Bericht des Technischen Proefstandes Oppau nr. 539.

ÜBER DEN KYBOLWERT UND SEINE BESTIMMUNG (DETERMINATION OF THE EFFECT OF KYBOL (TECH. DIETHYLBENZENE) ADDITIONS TO MOTOR FUELS), by Drs. Witschakowski and Schütze. I. G. Farbenindustrie A. G., Ludwigshafen, Ger. Jul 1943. 18f graphs (Text in German) Mi $1.75, Enl Pr $3.75.
PB 102497

1. Kybol (Trade name) 2. Benzene, Diethyl - Germany 3. Fuels, Automotive - Knocking - Germany 4. Micro BIOS FD 66/46, Item 72, Frames 9490-9506

Abstract available as PB 102497s. 1p. Mi $1.25, Ph $1.25. Bericht des Technischen Proefstandes Oppau nr. 547.

UNTERSUCHUNG DER ENTZÜNDLICHKEIT VON KOLZKOHLE DURCH BATTERIESTROM (IGNITION OF CHARCOAL BY ELECTRIC CURRENT), by Glück. I. G. Farbenindustrie A. G., Oppau, Ger. Jul 1942. 6f photos (Text in German) Mi $1.25, Enl Pr $2.50. PB 102368

1. Charcoal - Ignition, Electrical - Germany 2. Batteries, Storage - Uses - Germany 3. Micro BIOS FD 2867/46, Item 35, Frames 1-5.

Kurzbericht nr. 325. English abstract included. Abstract available as PB 102368s. 1p. Mi $1.25, Ph $1.25.

HIGHWAYS AND BRIDGES

AERODYNAMIC STABILITY OF SUSPENSION BRIDGES WITH SPECIAL REFERENCE TO THE TAKOMA NARROWS BRIDGE, PT. II: MATHEMATICAL ANALYSES, by Frederick C. Smith and George S. Vincent. Washington. University. Structural Research Laboratory. Oct 1950. 60p drawings, diagrs, graphs Available from University of Washington. Engineering Experiment Station, Seattle, Washington. PB 102408

1. Bridges, Suspension - Stability 2. Takoma Narrows bridge 3. U. S. Bureau of Public Roads.

University of Washington. Engineering Experiment Station. Bulletin 116, part II. Report of an investigation conducted by the Structural Research Laboratory, University of Washington, under the direction of the Washington Toll Bridge Authority in cooperation with the Bureau of Public Roads, Dept. of Commerce.

REPORTS OF COMMITTEE ON ROADSIDE DEVELOPMENT PRESENTED AT THE TWENTY-NINTH ANNUAL MEETING 1949, INCLUDING SPECIAL PAPERS. H. J. Neale, Chairman. U. S. Highway Research Board. Committee on Roadside Development. Nov 1950. 115p photos, diagrs, tables Available from U. S. Highway Research Board, 2101 Constitution Avenue, Washington 25, D. C. $1.50. PB 102515

1. Roads - Roadside development 2. Roads - Construction.

INSTRUMENTS

APPLICATIONS FOR THE ELECTRON MICROSCOPE IN VARIOUS INDUSTRIES. I. G. Farbenindustrie A. G., Leverkusen, Ger. Oct 1946. 18f photos Mi $1.75, Enl Pr $3.75. PB 102363

1. Microscopes, Electron - Germany 2. Micro BIOS FD 2053/48, Frames unnumbered.

Abstract available as PB 102363s. 2p. Mi $1.25, Ph $1.25. For description of the instrument, its application and technique see BIOS FR 1487.

DESIGN OF MODE FILTERS: FINAL REPORT, by William M. Goodhue. Polytechnic Research and Development Co., Inc., Brooklyn, N. Y. Dec 1949. 91p photos, drawings, tables Mi $4.25, Ph $12.50. PB 102514

1. Filters, Wave guide 2. Wave guides - Filters 3. U. S. Squier Signal Laboratory, Fort Monmouth, N. J. 4. SIG Contract W36-039-sc-36762.

Squier Signal Laboratory contract W36-039-sc-36762. File 4485-PH-48-91(3108). Signal Corps project 152B. Department of the Army project 3-99-15-022.

DEVELOPMENT OF HYPSOMETER METHOD OF ATMOSPHERIC PRESSURE MEASUREMENT. 18TH PROGRESS REPORT ON CONTRACT W-36-039-SC-32297, by J. E. Bigelow. General Electric Co., Schenectady, N. Y. Mar 1948. 46p drawings, graphs (part fold) Mi $2.50, Ph $6.25. PB 102284

1. Atmosphere - Pressure - Measurements 2. Hypsometers 3. SIG Contract W-36-039-sc-32297 Report 18.

DIRECT-READING VAPOR-PRESSURE PSYCHROMETER, by J. E. Dinger and R. W. Brown. U. S. Naval Research Laboratory. Sep 1950. 14p photos, diagrs, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.50. PB 102440

A psychrometer has been developed which makes use of temperature-sensitive resistance elements to introduce the values of the wet- and dry-bulb temperatures into a computing circuit. The circuit is designed to present the value of the measured humidity directly in terms of the water-vapor pressure without recourse to psychrometric tables. Provision is made for introducing the value of the barometric pressure into the computation. Three types of the instrument have been designed, each making use of a basic circuit involving two bridge circuits which introduce the values of the first and second terms respectively of the right-hand side of the psychrometric equation, $e=e' - 0.000367 P(t-t')$. NRL R 3731.

EIN GERAET ZUR PRÜFUNG DER SCHMIERFÄHIGKEIT VON ÖLEN DURCH BESTIMMUNG DES VERSCHLEISSES (INSTRUMENT FOR TESTING THE LUBRICATING CAPACITY OF OILS BY DETERMINING ITS WEAR) PRÜFUNG VON SCHMIERSTOFFEN DURCH VERSCHLEISSMESSUNG (TESTING LUBRICANTS BY MEASURING WEAR), by R. Halder. I. G. Farbenindustrie A. G., Oppau, Ger. Oct 1941-Jan 1943. 62f photos, drawings, graphs (Text in German and English) Mi $3.00, Enl Pr $10.00. PB 102494

1. Lubricating oils - Testing equipment - Germany 2. Wear - Measurement - Germany 3. Micro BIOS FD 2866/46, Item 23, Frames 1-52+8.

Abstract available as PB 102494s. 2p. Mi $1.25, Ph $1.25. Report no. 478 and no. 518. English translation of no. 518.

ELECTRON MICROSCOPE AND INFRARED SPECTROPHOTOMETER, UTILIZATION OF, FOR THE EXAMINATION AND TESTING OF MATERIALS, JANUARY 19, TO JUNE 15, 1949. PART I, by Stanley Szawlewicz. U. S. Naval Air Material Center. Aeronautical Materials Laboratory, Philadelphia, Pa. Aug 1949. 26p photo, drawings, tables Mi $2.00, Ph $3.75. PB 102546

An investigation was made to establish methods and techniques for the use of the electron microscope with the electron diffraction adapter in the study and identification of corrosion films on metal specimens in the evaluation of moisture vapor barrier materials in accordance with Spec. AN-B-20. Copper is the only metal used thus far for electron diffraction studies. Copper specimens were sealed in envelopes fabricated of the moisture vapor barrier material and heated for 48 hours at 150 $\pm 2^{\circ}$F and tested under the specification requirements. Reflection and transmission diffraction patterns of the corroded specimens were photographed and identified by comparing with X-ray data. The sensitivity of the method necessitates special care in the preparation of specimens. NAM AML 424526, Part I.

ELECTRONIC ANALYSER FOR LINEAR DIFFERENTIAL EQUATIONS, by J. J. Gait and D. W. Allen. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Dec 1947. 37p photo, diagrs, graphs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.75. PB 102328

This report describes preliminary work undertaken to investigate the possibility of constructing an electronic differential analyser. The basic operations required are addition, subtraction, integration and differentiation. Section II describes briefly how these operations may be performed using feedback networks associated with high gain D. C. amplifiers and the Appendices to the report give a more detailed discussion of the accuracy and limitations of these methods. Section III describes the technique of combining a series of such units into a flexible differential analyser and shows how a linear fifth order differential equation with specified initial conditions would be set up and how appropriate time scales of operation and scale factors would be determined. As an indication of the performance of such an electronic differential analyser the solutions obtained for a fourth order linear differential equation are given in Section IV and compared with the theoretical solutions. Cover date is 1950. S.O. Code no. 23-9006-23. Report no. G. W. 1. ARC CP 23.

ELECTRONIC SIMULATOR FOR THE SOLUTION OF FLUTTER AND VIBRATION PROBLEMS, by F. Smith. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Oct 1949. 14p diagrs Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 102327

This report describes the basic principles of an electronic simulator to solve the equations for coupled oscillations in several degrees of freedom. The method has direct application to flutter and vibration problems on aircraft. The use of electronic amplifiers as adding and integrating units is described and the method of representing a simple harmonic motion is given. Methods of variation of coefficients are developed, and the problem of coupling two or more groups of amplifiers to correspond to two or more degrees of freedom in flutter is discussed. Cover date is 1950. S.O. Code no. 23-9006-26. Report no. Structures 51. ARC CP 26.

FREQUENCY ANALYSIS BY ELECTRONIC ANALOG METHODS, by W. A. McCool. U. S. Naval Research Laboratory. Aug 1950. 15p diagrs Available from the Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $.50. PB 102439

The frequency spectrum of an arbitrary function or waveform, f(t), is defined as the magnitude of the direct Fourier transform of f(t), as a function of frequency, ω. Employing electronic analog computing techniques, one can evaluate the transform for each frequency of interest from the steady-state solutions of a differential system describing simple harmonic motion forced by the function whose spectrum is desired. This technique is extended to the determination of the real function corresponding to a given frequency spectrum by evaluating the inverse Fourier transform. In the appendixes are given (1) an analytic example which demonstrates the technique and its extension and shows that the successive application of the transform is a periodic process and (2) a description of the electronic analog computing circuit in terms of simple feedback-amplifier theory. NRL R 3724.

HERMETICALLY SEALED STANDARD REFERENCE CAVITIES AND HERMETICALLY SEALED VARIABLE FREQUENCY METER, by Thomas P. Hahn and John E. Setaro. Polytechnic Research and Development Co., Inc., Brooklyn, N. Y. Feb 1948. 14p drawings Mi $1.75, Ph $2.50. PB 102525

An interim engineering report is presented on the development of hermetically sealed reference cavities and a hermetically sealed variable frequency meter. Satisfactory progress has been made in the design and fabrication of the carrying case for reference cavity FR-2 (XA)/U. If the results of the frequency stability tests on the cavity over the required temperature range are satisfactory, the complete equipment will be ready for delivery. Several of the fabricated parts for the frequency meter FR-3 (XA)/U have been received and checked. The pulse amplifier was wired and is ready for electrical tests. The reference cavity will be sealed and checked for leaks on the sensitive Hydrogen Diffusion Detector. Engineering Report no. 5, 8-14. AMC Wright Field Contract W 33-038 ac-15142.

INVESTIGATIONS OF THE MEASUREMENT OF NOISE. PROGRESS REPORT NO. 13, APR 1, 1949 TO JUN 30, 1949, by Conrad J. Fowler. Pennsylvania. University. Moore School of Electrical Engineering and U. S. Bureau of Ships. Jul 1949. 19p fold. diagrs, graph. (Incorrectly entered in Bib. v. 14, p. 186). PB 110117

1. Noise - Measurements 2. Meters, Sound.

Contract NObsr 39269. For progress reports 1-10, 12, 14-15 see PB 85974-PB 85981, PB 110114-PB 110116, PB 110118-PB 110119.

PHYSICAL REALIZATION OF AN ELECTRONIC COMPUTING INSTRUMENT, 1ST INTERIM PROGRESS REPORT, by Julian H. Bigelow, James H. Pomerene, Ralph J. Slutz, Willis H. Ware. Princeton University. Institute for Advanced Study. Jan 1947. 135p photos, drawings, diagrs Mi $5.50, Ph $17.50. PB 102355

1. Computers, Electronic.

Contract W-36-034-ORD-7481. For 2d-5th reports see PB 102356-102359. See also PB 96703.

PHYSICAL REALIZATION OF AN ELECTRONIC COMPUTING INSTRUMENT, 2D INTERIM PROGRESS REPORT, by Julian H. Bigelow, Theodore W. Hildebrandt, James H. Pomerene, Richard L. Snyder, Ralph L. Slutz, Willis H. Ware. Princeton University. Institute for Advanced Study. Jul 1947. 132p photos, diagrs (part fold) fold drawing, graphs Mi $5.50, Ph $17.50. PB 102356

1. Computers, Electronic.

Contract W-36-034-ORD-7481. For 1st, 3d-5th reports see PB 102355, 102357-102359. See also PB 96703.

PHYSICAL REALIZATION OF AN ELECTRONIC COMPUTING INSTRUMENT, 3D INTERIM PROGRESS REPORT, by Julian H. Bigelow, Theodore W. Hildebrandt, James H. Pomerene, Jack Rosenberg,

Ralph J. Slutz, Willis H. Ware. Princeton University. Institute for Advanced Study. Jan 1948. 158p Mi $6.00, Ph $20.00. PB 102357

1. Computers, Electronic.

Contract W-36-034 ORD-7481. For 1st-2d, 4th-5th reports see PB 102355-102356, PB 102358-102359. See also PB 96703.

PHYSICAL REALIZATION OF AN ELECTRONIC COMPUTING INSTRUMENT, 4TH INTERIM PROGRESS REPORT, by Julian H. Bigelow, Theodore W. Hildebrandt, Peter Panagos, James H. Pomerene, Jack Rosenberg, Ralph J. Slutz, Willis H. Ware. Princeton University. Institute for Advanced Study. Jul 1948. 125p photos, drawings, diagrs (part fold) Mi $5.00, Ph $16.25. PB 102358

1. Computers, Electronic.

Contract W-36-034-ORD-7481. For 1st-3d, 5th reports see PB 102355-102357, PB 102359. See also PB 96703.

WEITERENTWICKLUNG DES PIEZO-ELEKTRISCHEN AUFNAHMEVERFAHRENS FÜR RUCKSTOSS-MESSUNGEN (FURTHER DEVELOPMENT OF THE PIEZO-ELECTRIC RECORDING METHOD FOR MEASURING PRESSURE SURGES). Rheinmetall-Borsig A. G., Berlin. Jul 1936. 22f graphs, tables (Text in German) Mi $2.00, Enl Pr $5.00. PB 102366

1. Pressure - Measurements - Germany 2. Recorders, Piezo-electric - Germany 3. Micro BIOS FD 2488/46, Frames 1151-1171.

English abstract included. Abstract available as PB 102366s. 1p. Mi $1.25, Ph $1.25. MKW-SB 192.

LUMBER AND WOOD PRODUCTS

REQUIREMENTS AND PROPERTIES OF ADHESIVES FOR WOOD, by R.A.G. Knight. Gt. Brit. Dept. of Scientific and Industrial Research. Forest Products Research Laboratory, Aylesbury, England. Jun 1950. 31p tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.30. PB 68108r

The following chapters appear: The uses of glue, requirements of a glue, behaviour of adhesives, classification of adhesives, terms used in gluing work, detailed description of the seven types of adhesive - (1) animal glues, (2) blood albumin, (3) casein glue, (4) sodium silicate, (5) soya and other vegetable proteins, (6) starch derivatives, and (7) synthetic resins; synthetic resin glues and the question of acidity, testing adhesives, composite and extended glues, toxic additions to glues of organic origin, adhesives and the user's responsibilities. For basic report see PB 68108. S.O. Code no. 47-68-20-50. DSIR FPR 20, rev.

STUDIES ON CELLULOSE REACTIONS, by Tore Timell. Royal Swedish Academy of Engineering Sciences. 1950. 260p photos, drawings, graphs, tables Mi $9.00, Ph $32.50. PB 102310

1. Cellulose - Research - Sweden 2. Royal Swedish Academy of Engineering Sciences. Handlingar no. 205.

Most of this research published in Svensk papperstidning 1948 and 1949 and in Svensk kemisk tidskrift 1949.

THEORETISCHE PROBLEME UND PRAKTISCHE AUFGABEN DER KÜNSTLICHEN HOLZTROCKNUNG (THEORETICAL PROBLEMS AND PRACTICAL DATA IN CONNECTION WITH KILN DRYING OF WOOD), by F. Kollmann. Svenska Träforskningsinstitutet, Trätekniska Avdelningen. Mar 1949. 11p drawings, graphs (Text in German) Mi $1.75, Ph $2.50. PB 102022

1. Wood - Drying - Sweden 2. Svenska Träforskningsinstitutet. Meddelande 11B.

Reprinted from Trävaruindustrien nr. 18, 1949.

UNTERSUCHUNGEN ÜBER DIE URSACHEN VON SCHÄDEN BEI DER TROCKNUNG VON GRÜNEM EICHENHOLZ ZUGLEICH MITTEILUNGEN ÜBER FESTIGKEITSPRÜFUNGEN AN HOLZ IM HOCHFREQUENTEN WECHSELFELD (RESEARCH ON THE REASON FOR DEFECTS IN DRYING OF GREEN OAK WOOD AND REPORT ON TENSILE TESTS OF WOOD IN HIGH FREQUENCY ALTERNATING FIELDS), by F. Kollmann. Svenska Träforskningsinstitutet. Trätekniska Avdelningen. 1950. 30p photos, drawings, diagrs, graphs, tables (Text in German) Mi $2.00, Enl Pr $3.75. PB 102023

1. Wood - Drying - Sweden 2. Wood - Tests - Sweden 3. Svenska Träforskningsinstitutet. Meddelande 21.

MACHINERY

ABSTRACT. DISTRIBUTION AND COMBUSTION OF FUEL SPRAYS IN SOLID INJECTION DIESEL ENGINES, by Genziro Hamabe and Huzio Nagao. Jul 1947. 7p Mi $1.25, Ph $1.25. PB 102522

The range of combustion and distribution of fuel spray in a two-stroke-cycle Diesel cylinder, provided with a quartz window, is studied by observing the flame travel and intensity at various points by means of a photoelectric cell. Oil particles in the fuel spray and speed of combustion are concentrated in the center and decrease sharply toward the edge. The fuel spray covers little over a 10^{o} cone, but the area in which combustion occurs is wider than the fuel spray cone angle and extends over 30^{o}. Contact between fuel spray and air in the center is poor and the flame is weak because of the large density of the oil particles. Around the center, the flame is strong and gradually weakens toward the edge where the oil particles are thinner. The flow of air does not change the shape of the flame. From Kyoto. Imperial University. Translated abstract from the Japanese. AAF T-2 T/5330.

ANALYSIS OF THE EFFECTS OF DESIGN PRESSURE RATIO PER STAGE AND OFF-DESIGN EFFICIENCY ON THE OPERATING RANGE OF MULTISTAGE AXIAL-FLOW COMPRESSORS, by Melvyn Savage and Willard R. Westphal. U. S. National Advisory Committee for Aeronautics. Dec 1950. 33p diagr, graphs, tables Mi $2.25, Ph $5.00. PB 102508

An analysis is presented of how the operating range and over-all efficiency of a multistage axial-flow compressor are affected by the off-design efficiency characteristics of the blade row. General analytic expressions describing the off-design per-

formance of a blade row are presented. These expressions are analyzed and the effects of design pressure ratio per stage and off-design blade-row efficiency on the range are discussed. NACA TN 2248.

BEITRAG ZUR KENNTNIS DER SINTERSTAHL-TECHNIK (SINTERED STEEL ENGINEERING). Sintermetallwerk G.m.b.H., Krebsöge, Ger. Aug 1946. 11f photos, diagrs (Text in German) Mi $1.75, Enl Pr $3.75. PB 102376

1. Steel, Sintered - Germany 2. Presses - Powder metallurgy - Design - Germany 3. Micro BIOS FD 4384/47, Frames 1-10.

English abstract included. Abstract available as PB 102376s. 1p. Mi $1.25, Ph $1.25.

COMPRESSIBILITY CORRECTION FOR TURNING ANGLES OF AXIAL-FLOW INLET GUIDE VANES, by Seymour Lieblein and Donald M. Sandercock. U. S. National Advisory Committee for Aeronautics. Dec 1950. 31p diagrs, graphs, tables Mi $2.25, Ph $5.00. PB 102506

Simplified extension of Prandtl-Glauert compressibility correction for isolated airfoils was obtained for airfoils in cascade with axial air inlet at moderate values of camber and solidity by considering total lift coefficient of cascade to be composed of two components. One lift coefficient component is associated with velocity of constant magnitude across cascade and the other component is associated with change in velocity across cascade. From the hypothesis, an analytical variation of air turning angle with inlet Mach number at fixed angle of attack was obtained for two-dimensional flow. NACA TN 2215.

CYLINDER HEAD - XI-2220 ENGINE: SUMMARY OF CYLINDER HEAD DEVELOPMENT, by Robert C. Juvinall. Chrysler Corporation. Engineering Division, Detroit, Michigan. Jun 1945. 77p photos, drawings, graphs Mi $3.50, Ph $10.00. PB 102526

Development of XI-2220 cylinder head involves testing 369 separate heads of 18 different designs. Structural evolution of cylinder head was concerned with strengthening lower thread section, reducing stress concentrations on the glycol side of combustion chamber dome, and reducing jacket stresses. Material with good strength and comparatively high ductibility was used to increase life of cylinder head. Current E-75890 is completely satisfactory for present multicylinder engine ratings. No primary failures occurred during testing program. Technical report no. A-60209.4. Contract W-535-ac-18195, Article 1 (a), Items 1 (h) (3), 1 (h) (5), 1 (h) (6), 1 (h) (12), and 1 (h) (27).

DRAWINGS OF A SUPER-FINISHING ATTACHMENT. Ford Motor Company A. G., Cologne, Ger. 1942. 44f drawings only (Legends in German) Mi $2.50, Enl Pr $7.50. PB 102375

1. Machines, Superfinishing - Germany 2. BIOS FR 1519 LD 3. Micro BIOS FD 4227/47, Frames 1-13.

English abstract included. Abstract available as PB 102375s. 1p. Mi $1.25, Ph $1.25. Described in BIOS FR 1519, p. 14. Some drawings will not reproduce well.

DRAWINGS OF LIGHT CAR CHASSIS WITH THREE-CYLINDER TWO-STROKE ENGINE, PART I, REEL 1. Auto-Union A. G., Berlin. 1938-1941. 169f drawings (Legends in German) Mi $6.25, Enl Pr $22.50. PB 102270

1. Automobiles - Design - Germany 2. Engines, Automotive - Design - Germany 3. Micro BIOS FD 5180/47, Pt. 1, reel 1.

Abstract available as PB 102270s. 2p. Mi $1.25, Ph $1.25. For other parts see PB 102271-102274.

ENTWICKLUNG EINER HOHLSCHAUFEL FÜR ABGASTURBINEN BEI BMW-MÜCHEN (DEVELOPMENT OF A HOLLOW BLADE FOR EXHAUST GAS TURBINES), by H. Kohlmann. Dec 1950. 44p photos, drawings, graphs Mi $2.50, Ph $6.25. PB 38924t

The subject of the development of German hollow turbine blades for use with internal cooling is discussed in detail. The development of a suitable blade profile from cascade theory is described. Also a discussion of the temperature distribution and stresses in a turbine blade is presented. Various methods of manufacturing hollow turbine blades and the methods by which they are mounted in the turbine rotor are presented in detail. NACA TM 1289.

FERROPRINTS RELATING TO THE MANUFACTURE OF CABLES AND WIRES. Prause, Paul, Maschinenfabrik, Wuppertal, Ger. 1927-1942. 7f drawings only (Legends in German) Mi $1.25, Enl Pr $2.50. PB 102377

1. Cables - Manufacture - Germany 2. Wire - Manufacture - Germany 3. Micro BIOS FD 4401/47, Frames 1-4.

English abstract included. Abstract available as PB 102377s. 1p. Mi $1.25, Ph $1.25.

GERMAN METHOD OF BLADE DESIGN, by F. Gardiner. Jun 1946. 3p diagr Mi $1.25, Ph $1.25. PB 102529

Method finds a blade having a certain circular arc camber and angle of attack in order to fulfill a given velocity diagram. Analysis produces a potential flow system which is equivalent to the actual flow. Resulting equations give a blade having the desired characteristics. Method is very sensitive, however, to the value of the reduction in lift coefficient factor and should be regarded merely as a basis establishing theoretical correlation with test results. Method is derived from a book by Weinig and was worked into a practical method for engineers by the Eckert group. Pages are numbered p. 23-25.

OPERATION OF MAPLE SAP EVAPORATORS USING OIL BURNERS, by Laurance E. Webber and Lauren E. Seeley. New Hampshire. University. Engineering Experiment Station, Durham, N. H. Jul 1950. 8p photos, tables Available from Engineering Experiment Station, University of New Hampshire, Durham, N. H. PB 102444

Report covers a survey and series of tests including operational figures and conclusions on the oil firing of sap evaporators. Engineering publication no. 9.

PRINTS OF CERAMIC TUNNEL-OVEN FOR "DEGUSSA". Keramische Industrie-Bedarfs K. G.,

Berlin. Jul 1948. 188f drawings only (Legends in German) Mi $6.75, Enl Pr $25.00. PB 102438

1. Furnaces - Design - Germany 2. Deutsche Gold- und Silberscheideanstalt, Frankfurt, Ger. - Plants - Layouts 3. Micro BIOS FD 4735/47, Frames 1-44.

English abstract included. Includes prints of plant layout of Degussa.

PRUEFVORSCHRIFT SOWIE EINSTELL- EINBAU- UND EINREGULIERUNGSANWEISUNGEN...SCHAUFELRAD...DB 603. (COOLANT PUMP WITH SPIRAL HOUSING AND TURBINE WHEEL FOR DB 603 (12 CYLINDER V ENGINE)), by Herr Lengnick and Herr Trautmann. Feb 1945. 8p graph (Text in German and English) Mi $1.25, Ph $1.25. PB 102527

Test procedure for determination of delivery characteristics of the coolant pump for the heat exchanger of the DB 603 twelve-cylinder V-type engine is described. Instructions are given for measuring pressure head, temperature, and speed. A pressure of 12.80 psia in front of the pump is necessary, which is subtracted from the absolute pressure behind the pump to obtain pressure head data. Measurements are to be taken at test points lying at 18.8 and 21 mm water column. Deliveries of 5.4 and 4.0 kg/sec at the test points are acceptable and if these values are not reached, the pump must be considered unsatisfactory. AAF T-2 T/3115.

REPORT OF MEASURING TEMPERATURE OF PISTONS, by F. Glen Shoemaker. U. S. Air Materiel Command. Engineering Division. Power Plant Laboratory, Wright-Patterson Air Force Base, Dayton, Ohio. Jun 1927. 16p photos, drawings, graph Mi $1.75, Ph $2.50. PB 102550

1. Pistons - Temperature - Measurements 2. AAF TR 2825.

RESEARCH WORK ON TURBINE BLADES. Deutsche Versuchsanstalt für Luftfahrt E. V., Garmisch, Ger. n.d. 13f tables (Text in German and English) Mi $1.75, Enl Pr $3.75. PB 102437

1. Turbines, Gas - Blades - Germany 2. Micro BIOS FD 4684/47, Frames 1-2.

English abstract included. Abstract available as PB 102437s. 1p. Mi $1.25, Ph $1.25.

TEST OF A HIGH SPEED STEEL CUTTER. Studiengesellschaft Hartmetall, Berlin. Feb 1941. 2f (Text in German) Mi $1.25, Enl Pr $1.50. PB 102473

1. Tools, Cutting - Tests 2. BIOS FR 925 LD 3. Micro BIOS HEC 11278 4. Micro BIOS FD 3865/47, Frame 1.

English abstract included. Abstract available as PB 102473s. 1p. Mi $1.25, Ph $1.25. Listed in BIOS FR 925 appx. I, p. 27 as HEC 11278.

THEORETICAL STUDY OF THE THERMODYNAMIC CONDITIONS IN GAS TURBINES DUE TO BLADE COOLING BY THE USE OF LIQUID: HIGH TEMPERATURE GAS TURBINES WITH COOLED BLADES, A PRELIMINARY SURVEY OF TWO SIMPLE PLANTS, by W. R. Hawthorne. Massachusetts Institute of Technology. Gas Turbine Laboratory. May 1949. 11p tables Mi $1.75, Ph $2.50. PB 102520

A design study has been made, based on an earlier investigation of the effect of blade cooling on the thermodynamic performance of a turbine, to determine the order of magnitude of the effect of cooling on overall turbine performance. In both plants studied, the temperature inlet of the turbine was set at 2500°F. One plant had no regenerator and a pressure ratio of 15; the other was fitted with a regenerator and had a pressure ratio of 5. Results indicate that it is difficult to obtain much improvement in efficiency by increasing the turbine inlet temperature from 1500 to 2500°F, but a large increase in power output is achievable. Office of Naval Research Contract N5-ori-78, Task order 21. NR-220-010. Report 6574-4, Project DIC 6574. For Technical report no. 1 see PB 100528. MIT GTL TR4.

TWO-DIMENSIONAL COMPRESSIBLE FLOW IN CENTRIFUGAL COMPRESSORS WITH LOGARITHMIC-SPIRAL BLADES, by Gaylord O. Ellis and John D. Stanitz. U. S. National Advisory Committee for Aeronautics. Jan 1951. 45p diagrs, graphs, tables Mi $2.50, Ph $6.25. PB 102563

Two numerical examples are presented for two-dimensional, compressible, nonviscous flow in centrifugal compressors with backward-curved, logarithmic-spiral blades. The two examples are for different blade angles and are compared with a third example for straight, radial blades. The numerical results are presented in tables of the stream-function distribution and in plots of the streamlines, constant Mach number lines, and constant-pressure-ratio lines. In addition, a simplified analysis for logarithmic-spiral blades is presented that can be used to determine flow conditions within the impeller except near the impeller tip and impeller inlet. NACA TN 2255.

ÜBER DEN ZUSAMMENHANG ZWISCHEN AUFBAUSCHNEIDE, KOLKUNG UND GEFÜGE DES SPANES BEIM DREHEN VON STAHL MIT HARTMETALLWERKZEUGEN (RELATION BETWEEN EDGE LIFE, CRATER FORMATION AND STRUCTURE IN TURNING WITH HARD METAL TOOL TIPS). Studiengesellschaft Hartmetall, Berlin. Aug 1940. 10f photos (Text in German) Mi $1.25, Enl Pr $2.50. PB 102458

1. Tools, Cutting - Hard facing - Cutting tests - Germany 2. Tools, Cutting - Research - Germany 3. BIOS FR 925 LD 4. Micro BIOS HEC 11237 5. Micro BIOS FD 3844/47, Frames 1-8.

English abstract included. Abstract available as PB 102458s. 2p. Mi $1.25, Ph $1.25. Listed in BIOS FR 925 appx. I, p. 22.

WEICHSTAHL-WALZENLAGER (ROLLER BEARINGS OF MILD STEEL) WALZENLAGER AUS GUSSEISEN (ROLLER BEARINGS FROM CAST IRON), by Otto Rüding. Verein Deutscher Eisenhüttenleute, Düsseldorf, Ger. Aug 1943-Sep 1944. 6f photos, drawings (Text in German) Mi $1.25, Enl Pr $2.50. PB 102395

1. Roller bearings, Steel - Germany 2. Roller bearings, Cast iron - Germany 3. Micro BIOS FD 2011/48, Frames 1-6.

Abstract available as PB 102395s. 2p. Mi $1.25, Ph $1.25. Bericht nr. 48 and nr. 76.

MEDICAL RESEARCH AND PRACTICE

ANTIBODY RESPONSE OF ANIMALS EXPOSED TO X-RADIATION. 2. FURTHER INVESTIGATIONS OF THE EFFECT OF ADRENAL CORTICAL EXTRACT ON CIRCULATING ANTIBODY TITERS OF X-RADIATED ANIMALS, by Roland B. Mitchell, John D. Fulton, John M. Talbot and Allyn W. Kimball. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Oct 1950. 10p graphs, tables Mi $1.25, Ph $1.25. PB 102577

1. AAF SAM Proj 21-47-002, Report no. 2.
For report no. 1 see PB 102576.

INVESTIGATION OF THE TOXICITY OF PROPOSED FIRE EXTINGUISHING FLUIDS. PT. I: SUMMARY, BY WILLIAM H. CHAMBERS AND EUGENE KRACKOW. PT. II: APPROXIMATE LETHAL CONCENTRATION TO RATS BY INHALATION OF VAPORS FOR 15 MINUTES, BY CHARLES C. COMSTOCK, FRANCIS P. MCGRATH, STANLEY B. GOLDBERG, LORRAINE H. LAWSON. PT. III: PATHOLOGY IN RATS PRODUCED BY INHALATION OF VAPORS OF PROPOSED FIRE EXTINGUISHING COMPOUNDS, by J. K. MacNamee. U. S. Chemical Corps. Medical Division. Army Chemical Center, Md. Oct 1950. 41p tables Mi $2.50, Ph $6.25. PB 102047

Detailed reports on the screening of 10 candidate fire extinguishing compounds and 4 "comparator" or control compounds compose parts II and III. The experimental work consisted of acute toxicity tests by inhalation in rats and a study of the resultant pathological effects upon these rats of the pure vapors and of the combustion products of these compounds from pyrolysis at 800°C. Observations were also made estimating the time of onset of narcosis in these animals. Each part is supported by tables and bibliography. Conclusions and recommendations are also given. CC MD R23.

METHODS FOR THE DETECTION OF TOXIC GASES IN INDUSTRY: NITROUS FUMES. Gt. Brit. Dept. of Scientific and Industrial Research. Jan 1939. 10p drawing, table Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.10. PB 102442

1. Gases - Toxicity - Gt. Brit. 2. Nitrogen compounds - Toxicity - Gt. Brit. 3. DSIR L 5.
S.O. Code no. 47-112-5.

PLANNED SEEING; SOME PSYCHOLOGICAL EXPERIMENTS, by Frederic Bartlett and N. H. Mackworth. Gt. Brit. Air Ministry. 1950. 90p photos (1 col.), diagrs, graphs, tables (1 col.) Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.25. PB 102523

1. Airplanes, Fighter - Controls - Gt. Brit. 2. Airports - Controls towers - Operators - Gt. Brit. 3. Indicators, Target course - Gt. Brit. 4. Targets, Aerial - Visibility - Gt. Brit. 5. AM AP 3139B.
Contents: - I. Visibility in the control rooms of fighter command, p. 1-32. - II. Synthetic training of pathfinder air bombers in visual centering on target indicators. p. 33-76.

STANDARD BIOCHEMICAL PROCEDURES IN MEDICINE AND THEIR INTERPRETATIONS, by Ralph M. Thompson. U. S. Air Force. School of Aviation Medicine, Randolph Field, Texas. Sep 1950. 12p Mi $1.75, Ph $2.50. PB 102403

The various substances are tabulated under the following headings: (a) normal adult findings, (b) method, (c) increase, and (d) decrease.

METALS AND METAL PRODUCTS

ALLOY FORMATION OF CO-CU-WC, by Dr. Dawihl. Studiengesellschaft Hartmetall, Berlin. Aug 1940. 2f (Text in German) Mi $1.25, Enl Pr $1.50. PB 102456

1. Cobalt-copper-tungsten carbide alloys - Germany 2. BIOS FR 925 LD 3. Micro BIOS HEC 11234 4. Micro BIOS FD 3842/47, Frame 1.
English abstract included. Abstract available as PB 102456s. 1p. Mi $1.25, Ph $1.25. Listed in BIOS FR 925 appx. I, p. 22.

BEEINFLUSSUNG DES SINTERVERHALTENS VON WOLFRAMKARBID DURCH METALLZUSÄTE (INFLUENCE OF METAL ADDITIONS ON THE SINTERING BEHAVIOR OF TUNGSTEN CARBIDE), by Dr. Dawihl. Studiengesellschaft Hartmetall, Berlin. Mar 1941. 5f graph, table (Text in German) Mi $1.25, Enl Pr $1.50. PB 102433

1. Tungsten carbides - Sintering - Germany 2. Tungsten carbides - Effect of metal additions - Germany 3. BIOS FR 925 LD 4. Micro BIOS HEC 11288 5. Micro BIOS FD 3873/47, Frames 1-4.
English abstract included. Abstract available as PB 102433s. 1p. Mi $1.25, Ph $1.25. Listed in BIOS FR 925 appx. I, p. 28.

BERICHT ÜBER PHYSIKALISCH-CHEMISCHE GRUNDLAGEN DES LURGI-AUFBEREITUNGS-VERFAHRENS, UNTER BESONDERER BERÜCKSICHTIGUNG DER FORSCHUNGSARBEITEN DER METALLGESELLSCHAFT (REPORT ON PHYSICO-CHEMICAL PRINCIPLES OF THE LURGI IRON ORE DRESSING METHOD, WITH SPECIAL REFERENCE TO THE RESEARCH WORK OF METALLGESELLSCHAFT), by H. Ley and H. Kassner. Metallgesellschaft A. G., Frankfort, Ger. Aug 1942. 52f graphs, tables (Text in German) Mi $2.75, Enl Pr $8.75. PB 102385

1. Iron ores - Magnetic roasting - Germany 2. Lurgi process (Iron ore concentration) 3. Micro BIOS FD 276/48, Frames 941-993.
Abstract available as PB 102385s. 2p. Mi $1.25, Ph $1.25.

BESTIMMUNG DER GEFÜGETEILE VERSCHIEDENER AUFSCHWEISSLEGIERUNGEN (DETERMINATION OF THE STRUCTURAL CONSTITUENTS OF VARIOUS WELDING ALLOYS). Studiengesellschaft Hartmetall, Berlin. Mar 1941. 11f photos (Text in German) Mi $1.75, Enl Pr $3.75. PB 102434

1. Iron alloys - Chemical analysis - Germany 2. Iron alloys - Tests - Germany 3. Verdur (Trade name) 4. Verdur 3 (Trade name) 5. Diaweld (Trade name) 6. Diaweld B (Trade name) 7. BIOS

FR 925 LD 8. Micro BIOS HEC 11289 9. Micro BIOS FD 3874/47, Frames 1-9.

English abstract included. Abstract available as PB 102434s. 1p. Mi $1.25, Ph $1.25. Listed in BIOS FR 925 appx. I, p. 28.

BOILING TESTS CARRIED OUT ON SPECIAL CARBURISED HARD METAL SCRAP, by Dr. Dawihl. Studiengesellschaft Hartmetall, Berlin. Jan-Feb 1941. 6f tables (Text in German) Mi $1.25, Enl Pr $2.50. PB 102474

1. Scrap metal - Recovery processes - Germany 2. BIOS FR 925 LD 3. Micro BIOS HEC 11269 4. Micro BIOS HEC 11272 5. Micro BIOS HEC 11279 6. Micro BIOS FD 3866/47, Frames 1-5.

English abstract included. Abstract available as PB 102474s. 1p. Mi $1.25, Ph $1.25. Listed in BIOS FR 925 appx. I, p. 26-27.

COMPARATIVE TESTS ON PROPERTIES AND PERFORMANCE OF W-TI-C-CO HARD METALS, MADE ACCORDING TO GERMAN PATENT D.R.P. 622347 ON THE ONE HAND, AND BRITISH PATENT 331121 ON THE OTHER HAND, by Dr. Dawihl. Studiengesellschaft Hartmetall, Berlin. Nov 1939. 17f (Text in German) Mi $1.75, Enl Pr $3.75. PB 102451

1. Tungsten carbide-cobalt alloys - Patents - Germany 2. Titanium-tungsten carbides - Patents - Germany 3. GP 622347 4. BIOS FR 925 LD 5. Micro BIOS HEC 11197 6. Micro BIOS FD 3822/47, Frames 1-15.

English abstract included. Abstract available as PB 102451s. 2p. Mi $1.25, Ph $1.25. Listed in BIOS FR 925 appx. I, p. 19 as HEC 11197.

COMPOSITION AND STRUCTURE OF HARD METALS. Studiengesellschaft Hartmetall, Berlin. Aug 1939-Jun 1940. 41f photos (Text in German) Mi $2.50, Enl Pr $7.50. PB 102455

1. Metals, Hard - Analysis - Germany 2. Metals, Hard - Structure - Germany 3. BIOS FR 925 LD 4. Micro BIOS HEC 11184 5. Micro BIOS HEC 11186 6. Micro BIOS HEC 11211 7. Micro BIOS HEC 11212 8. Micro BIOS HEC 11222 9. Micro BIOS HEC 11225 10. Micro BIOS FD 3834/47, Frames 1-38.

English abstract included. Abstract available as PB 102455s. 2p. Mi $1.25, Ph $1.25. Listed in BIOS FR 925 appx. I, p. 17, 20-21.

CONFERENCE ON EXPERIMENTS FOR THE MANUFACTURE OF HARD METAL ARMOUR PLATING. Studiengesellschaft Hartmetall, Berlin. Oct 1940. 4f (Text in German) Mi $1.25, Enl Pr $1.50. PB 102462

1. Armor plate - Metallography - Germany 2. Armor plate - Manufacture - Germany 3. BIOS FR 925 LD 4. Micro BIOS HEC 11243 5. Micro BIOS FD 3848/47, Frames 1-3.

English abstract included. Abstract available as PB 102462s. 1p. Mi $1.25, Ph $1.25. Listed in BIOS FR 925 appx. I, p. 23. See also PB 102472.

DEVELOPMENT OF TUNGSTEN CARBIDE CRYSTALS IN RELATION TO TIME, AND TYPE AND AMOUNT OF BINDER. DETERMINATION OF STRENGTH OF SINTERED COMPACTS OF HARD METAL "N" AT SINTERING TEMPERATURES BELOW THE MELTING POINT OF THE EUTECTIC. SINTERING OF XX POWDER AT LOW TEMPERATURE. Studiengesellschaft Hartmetall, Berlin. Apr-Aug 1940. 19f photos, tables (Text in German) Mi $1.75, Enl Pr $3.75. PB 102457

1. Tungsten carbides - Crystals - Germany 2. Metals, Hard - Sintering - Germany 3. Widia XX (Hard metal) 4. BIOS FR 925 LD 5. Micro BIOS HEC 11210 6. Micro BIOS HEC 11219 7. Micro BIOS HEC 11235 8. Micro BIOS FD 3843/47, Frames 1-17.

English abstract included. Abstract available as PB 102457s. 2p. Mi $1.25, Ph $1.25. Listed in BIOS FR 925 appx. I, p. 20-22 as HEC 11210, 11219, 11235.

DIFFUSION OF CHROMIUM IN α COBALT-CHROMIUM SOLID SOLUTIONS, by John W. Weeton. U. S. National Advisory Committee for Aeronautics. Nov 1950. 38p photos, drawings, table Mi $2.25, Ph $5.00. PB 102279

Diffusion of chromium in α cobalt-chromium solid solutions was investigated in the range of 0 to 40 atomic percent at temperatures of 1360°, 1300°, 1150°, and 1000°C. The activation heat of diffusion was determined to be 63,600 calories per mole. When compared with most alloy systems for which diffusion data have been previously obtained, the diffusion rates of chromium in α cobalt-chromium solid solutions were found to be low. NACA TN 2218.

DURCHFÜHRUNG EINES GROSSVERSUCHES ZUM AUFSCHLUSS VON HARTMETALLSONDERSCHROTT MIT NATRIUMNITRIT (PROCEDURE FOR CARRYING OUT LARGE SCALE EXPERIMENTS WITH THE OBJECT OF BREAKING DOWN HARD METAL SCRAP WITH SODIUM NITRATE), by Dr. Dawihl. Studiengesellschaft Hartmetall, Berlin. Jan 1941. 5f (Text in German) Mi $1.25, Enl Pr $2.50. PB 102471

1. Scrap metal - Recovery processes - Germany 2. Sodium nitrate - Uses - Germany 3. BIOS FR 925 LD 4. Micro BIOS HEC 11264 5. Micro BIOS FD 3859/47, Frames 1-5.

Listed in BIOS FR 925 appx. I, p. 25 as HEC 11264

EINFLUSS DER HERSTELLUNGSART DER WOLFRAMSÄURE AUF DIE EIGENSCHAFTEN DES HARTMETALLES (INFLUENCE OF THE METHOD OF MANUFACTURE OF TUNGSTIC ACID ON THE PROPERTIES OF HARD METAL). Studiengesellschaft Hartmetall, Berlin. Mar 1941. 3f (Text in German) Mi $1.25, Enl Pr $1.50. PB 102432

1. Metals, Hard - Physical properties - Germany 2. Tungstic acid - Production - Methods - Germany 3. BIOS FR 925 LD 4. Micro BIOS HEC 11287 5. Micro BIOS FD 3872/47, Frames 1-3.

Listed in BIOS FR 925 appx. I, p. 28 as HEC 11287.

EINRICHTUNG ZUR HERSTELLUNG VON 5T WOLFRAMSÄURE AUS HARTMETALLABFÄLLEN JE MONAT NACH DEM NITRITVERFAHREN (A PLANT FOR THE MONTHLY PRODUCTION OF 5 TONS OF TUNGSTIC ACID BY NITRATING HARD METAL SCRAP), by Dr. Dawihl. Studiengesellschaft Hartmetall, Berlin. Mar 1941. 6f (Text in German) Mi $1.25, Enl Pr $2.50. PB 102435

1. Tungstic acid - Production - Germany 2. Scrap

metal - Recovery processes - Germany 3. BIOS FR 925 LD 4. Micro BIOS HEC 11291 5. Micro BIOS FD 3875/47, Frames 1-6.

Listed in BIOS FR 925 appx. I, p. 28 as HEC 11291.

EXPERIMENTS ON THE MANUFACTURE OF ARMOUR PLATE, by Dr. Dawihl. Studiengesellschaft Hartmetall, Berlin. Jan 1941. 3f (Text in German) Mi $1.25, Enl Pr $1.50. PB 102472

1. Armor plate - Manufacture - Germany 2. BIOS FR 925 LD 3. Micro BIOS HEC 11265 4. Micro BIOS FD 3860/47, Frames 1-2.

English abstract included. Abstract available as PB 102472s. 1p. Mi $1.25, Ph $1.25. Listed in BIOS FR 925 appx. I, p. 25. See also PB 102462.

GEFÜGEPRÜFUNG AN GEGESSENEN HARTMETALLEN (EXAMINATION OF STRUCTURE OF CAST HARD METAL), by Dr. Dawihl. Studiengesellschaft Hartmetall, Berlin. Aug 1940. 3f (Text in German) Mi $1.25, Enl Pr $1.50. PB 102371

1. Metals, Hard - Structural tests - Germany 2. BIOS FR 925 LD 3. Micro BIOS HEC 11236 4. Micro BIOS FD 3854/47, Frames 1-2.

English abstract included. Abstract available as PB 102371s. 1p. Mi $1.25, Ph $1.25. Listed in BIOS FR 925 appx. I, p. 22 as HEC 11236.

HÄRTE UND ZÄHIGKEIT VON CO-W-C UND CO-W LEGIERUNGEN (HARDNESS AND TENACITY OF CO-W-C AND CO-W ALLOYS). Studiengesellschaft Hartmetall, Berlin. Feb 1939. 4f tables (Text in German) Mi $1.25, Enl Pr $1.50. PB 102448

1. Cobalt-tungsten alloys - Germany 2. Tungsten carbide - Cobalt alloys - Germany 3. BIOS FR 925 LD 4. Micro BIOS HEC 11170 5. Micro BIOS FD 3803/47, Frames 1-3.

Listed in BIOS FR 925 appx. I, p. 16 as HEC 11,170.

INVESTIGATION INTO THE IRON, STEEL, ENGINEERING AND METALLURGICAL INDUSTRIES IN THE UNION OF SOUTH AFRICA. PART IV: HEAVY STRUCTURAL STEELWORK AND LIGHT FABRICATED METAL PRODUCTS, by A. J. Norval, W. F. J. Steenkamp, A. A. Moore, Harry A. Levy, F.J.C. Cronje. Union of South Africa. Board of Trade and Industries. Dec 1948. 23p fold. table Mi $2.00, Ph $3.75. PB 102123

1. Steel, Structural - Union of South Africa 2. Metal products - Union of South Africa.

Report 311, pt. IV.

INVESTIGATIONS INTO THE SYSTEM TITANIUM CARBIDE-TUNGSTEN CARBIDE. Studiengesellschaft Hartmetall, Berlin. 1938-1942. 49f photos (Text in German) Mi $2.50, Enl Pr $7.50. PB 102372

1. Titanium tungsten carbides - Germany 2. BIOS FR 925 LD 3. Micro BIOS HEC 11158 4. Micro BIOS HEC 11177 5. Micro BIOS HEC 11180 6. Micro BIOS HEC 11190 7. Micro BIOS HEC 11357 8. Micro BIOS HEC 11363 9. Micro BIOS FD 3913/47, Frames 1-47.

English abstract included. Listed in BIOS FR 925 appx. I, p. 15, 17-18, 34-35 as HEC 11158, 11177, 11180, 11190, 11357, 11363.

INVESTIGATION OF ELECTRODEPOSITED ALLOYS AND PURE METALS AS SUBSTITUTES FOR ZINC AND CADMIUM FOR PROTECTIVE FINISHES FOR STEEL PARTS OF AIRCRAFT, by A. B. Tripler, Jr. and C. L. Faust. Battelle Memorial Institute, Columbus, Ohio. Sep 1949. 88p photos, diagrs, graphs, tables Mi $3.75, Ph $11.25. PB 97655s

Eight alloys, selected as being superior to pure zinc or cadmium for protecting steel, were evaluated on the basis of static and dynamic electrode potentials and corrosion current densities in three media. Of these eight, the most outstanding corrosion resistant properties were shown by a zinc-silver alloy of 25% silver. A tabulated summary of the testing program on all cast and electrodeposited alloys tested is included. Final report on Contract W33-038-ac-21107 (20145). Supplement to PB 97655. AAF TR 5692, suppl. 1.

INVESTIGATION OF FAILED TURBINE BLADES FROM PT-103 - ENGINE NO. 500001, N-155 BAR STOCK MATERIAL (PART NUMBER 641010), by H. W. Hanes. Packard Motor Car Company, Detroit, Michigan. Feb 1947. 12p photos Mi $1.75, Ph $2.50. PB 102531

Upon failure, five turbine blades (N-155 material) and two blade stubs were submitted for metallurgical examination. Two blades had intergranular, transverse cracks (chord-wise) toward leading edge; two had internal longitudinal (spanwise) trailing edge cracks. Failures possibly were caused by flame impingement, foreign particles impinging on blades, lead attack, and inherent brittleness. Attempts to improve design of engine combustion chamber were recommended to improve temperature distribution of gases impinging on turbine blades; efforts were made to fabricate hollow, heat-resisting alloy turbine blades. Serial number RR-107. Issued for the Power Plant Laboratory, Air Materiel Command.

INVESTIGATION OF SWELLING IN HARD METAL ALLOYS. CAUSES OF SWELLING. Studiengesellschaft Hart metall, Berlin. Oct 1939-Jun 1943. 46f photos, diagr, graphs, tables (Text in German) Mi $2.50, Enl Pr $7.50. PB 102449

1. Alloys, Hard - Deformation - Germany 2. Metals Hard - Deformation - Germany 3. Tungsten carbides - Structure - Germany 4. BIOS FR 925 LD 5. Micro BIOS HEC 11193 6. Micro BIOS HEC 11396 7. Micro BIOS FD 3820/47, Frames 1-43.

English abstract included. Abstract available as PB 102449s. 2p. Mi $1.25, Ph $1.25. Listed in BIOS FR 925 appx. I, p. 18 and 38 as HEC 11,193 and 11,396. See also PB 102103.

INVESTIGATION TO ASCERTAIN THE BEST FORM OF CHIPS WHEN CUTTING STEELS WITH XX HARD METAL. Studiengesellschaft Hartmetall, Berlin. Jan 1936. 4f photos (Text in German) Mi $1.25, Enl Pr $1.50. PB 102447

1. Steel - Cutting - Germany 2. Tools, Cutting - Hard facing - Cutting tests - Germany 3. BIOS FR 925 LD 4. Micro BIOS HEC 11055 5. Micro BIOS FD 3739/47, Frames 1-4.

Abstract available as PB 102447s. 1p. Mi $1.25, Ph $1.25. Listed in BIOS FR 925 appx. I, p. 6.

LARGE POROSITY IN KRUPP'S XX. Studiengesellschaft Hartmetall, Berlin. Nov 1939. 8f photos (Text in German) Mi $1.25, Enl Pr $2.50. PB 102452

1. Widia XX (Hard metal) 2. Tungsten carbide alloys - Structure - Germany 3. BIOS FR 925 LD 4. Micro BIOS HEC 11198 5. Micro BIOS FD 3823/47, Frames 1-7.

English abstract included. Abstract available as PB 102452s. 1p. Mi $1.25, Ph $1.25. Listed in BIOS FR 925 appx. I, p. 19.

MACHINING TESTS AND MELTING EXPERIMENTS WITH MIXTURES OF HARD METAL CARBIDES OR NITRIDES WITH COBALT, IRON AND NICKEL. Studiengesellschaft Hartmetall, Berlin. Jan-Feb 1941. 21f tables (Text in German) Mi $2.00, Enl Pr $5.00. PB 102430

1. Alloys, Hard - Tests - Germany 2. Tungsten carbides - Cutting tests - Germany 3. Iron alloys - Tests - Germany 4. Cobalt alloys - Tests - Germany 5. Nickel alloys - Tests - Germany 6. BIOS FR 925 LD 7. Micro BIOS HEC 11274 8. Micro BIOS HEC 11275 9. Micro BIOS HEC 11283 10. Micro BIOS FD 3870/47, Frames 1-19.

English abstract included. Abstract available as PB 102430s. 2p. Mi $1.25, Ph $1.25. Listed in BIOS FR 925 appx. I, p. 26-27.

MANUFACTURE OF HARD METAL SHAPED BODIES BY TAMPING INTO MOULDS, by Dr. Dawihl. Studiengesellschaft Hartmetall, Berlin. Dec 1940. 3f (Text in German) Mi $1.25, Enl Pr $1.50. PB 102467

1, Metal powders - Moulding - Germany 2. BIOS FR 925 LD 3. Micro BIOS HEC 11257 4. Micro BIOS FD 3855/47, Frames 1-2.

English abstract included. Abstract available as PB 102467s. 1p. Mi $1.25, Ph $1.25. Listed in BIOS FR 925 appendix I, p. 24.

METALLOGRAPHISCHE UNTERSCHUNG DES AUFBAUS VON STAHL-DREHSPÄNEN (METALLOGRAPHIC EXAMINATION OF STRUCTURE OF STEEL TURNINGS), by Hilliger. Studiengesellschaft Hartmetall, Berlin. Nov 1940. 7f photos (Text in German) Mi $1.25, Enl Pr $2.50. PB 102466

1. Steel - Turnings - Germany 2. Steel - Metallography - Germany 3. BIOS FR 925 LD 4. Micro BIOS HEC 11249 5. Micro BIOS FD 3853/47, Frames 1-6.

English abstract included. Abstract available as PB 102466s. 1p. Mi $1.25, Ph $1.25. Listed in BIOS FR 925 appx. I, p. 24.

RELATIONSHIP BETWEEN HARD SPOTS AND COBALT SEGREGATION IN HARD METAL, by Dr. Dawihl. Studiengesellschaft Hartmetall, Berlin. Dec 1939. 9f (Text in German) Mi $1.25, Enl Pr $2.50. PB 102454

1. Widia XX (Hard metal) 2. Metals, Hard - Structural tests - Germany 3. Tungsten carbides - Sintering - Germany 4. BIOS FR 925 LD 5. Micro BIOS HEC 11200 6. Micro BIOS FD 3825/47, Frames 1-8.

English abstract included. Abstract available as PB 102454s. 1p. Mi $1.25, Ph $1.25. Listed in BIOS FR 925 appx. I, p. 19.

RICHTLINIEN FÜR DIE VERWENDUNG UNLEGIERTER STÄHLE VERSCHIEDENER HERSTELLUNGSVERFAHREN (DIRECTIVES FOR THE USE OF UNALLOYED STEELS PRODUCED BY DIFFERENT MANUFACTURING METHODS), by Dr. Ing. Karl Daeves and Dr. Hubert Hauttmann. Verein Deutscher Eisenhüttenleute, Düsseldorf, Ger. Apr 1943. 4f tables (Text in German) Mi $1.25, Enl Pr $1.50. PB 102394

1. Steel - Uses - Germany 2. Steel - Properties - Germany 3. Micro BIOS FD 2007/48, Frames 1-4.

Abstract available as PB 102394s. 1p. Mi $1.25, Ph $1.25. Bericht nr. 44.

SOLUBILITY OF TITANIUM CARBIDE AND ITS INFLUENCE IN THE HARDENING AND HEAT-TREATING OF TITANIUM-CONTAINING STEELS, BY E. HOUDREMONT, F. K. NAUMANN AND H. SCHRADER. INFLUENCE OF TITANIUM ON THE CREEP-RESISTANCE OF STEELS, by E. Houdremont and E. Bandel. Krupp, Friedrich A. G., Essen, Ger. 1942. 38f photos, graphs (Text in German) Mi $2.25, Enl Pr $6.25. PB 102436

1. Steel - Hardening - Germany 2. Steel - Heat treatment - Research - Germany 3. Steel - Creep tests - Germany 4. Titanium carbides - Effect on steel - Germany 5. Titanium carbides - Solubility - Germany 6. BIOS FR 396 LD 7. Micro BIOS FD 4669/47, Frames 1-36.

English abstract included. Abstract available as PB 102436s. 2p. Mi $1.25, Ph $1.25. Listed in BIOS FR 396, appx. 3, item 1 and 2. For schungsberichte no. 16, 1942.

STRUCTURE OF N HARD METALS WITH AN ADDITION OF BORIC ACID. Studiengesellschaft Hartmetall, Berlin. Jul 1940. 2f (Text in German) Mi $1.25, Enl Pr $1.50. PB 102429

1. Metals, Hard - Structure - Germany 2. Metals, Hard - Effect of boric acid - Germany 3. Boric acid - Effect on metals - Germany 4. BIOS FR 925 LD 5. Micro BIOS HEC 11233 6. Micro BIOS FD 3841/47, Frame 1.

English abstract included. Abstract available as PB 102429s. 1p. Mi $1.25, Ph $1.25. Listed in BIOS FR 925 appx. I, p. 22 as HEC 11233.

SURFACE IMPEDANCE OF SUPERCONDUCTING TIN MERCURY AND LEAD AT 9.200 MC/SEC, by I. Simon. Massachusetts Institute of Technology. Research Laboratory of Electronics, Cambridge, Mass. Jun 1949. 29p diagrs, graphs, table Mi $2.00, Ph $3.75. PB 102190

Surface impedance of 9200 mcps of tin, mercury, and lead in normal and superconducting states was measured by means of resonant cavity technique. Metals of highest purity were used and cast in glass molds in vacuo. Observed residual resistance at temperatures far below the transition point appears to be of the same order of magnitude as in previous investigations. Change of reactance in the superconducting state was measured. A method is outlined for obtaining, with the aid of the theory by Maxwell, Marcus, and Slater, the low-temperature limit of the penetration depth. Temperature dependence of penetration depth was derived from the measured changes of resistive and reactive part of the surface impedance of all three metals. From measurements in the normal state, the effective number of free electrons in tin and mercury was estimated to be 0.30 and 0.13 per atom. MIT RLE TR 126.

ÜBER DEN EINFLUSS DER KALTVERFORMUNG AUF DAS KORNWACHSTUM VON WOLFRAMKARBID (EFFECT OF COLD WORKING ON THE GRAIN STRUCTURE OF TUNGSTEN CARBIDE). Studiengesellschaft Hartmetall, Berlin. Sep 1940. 4f photos (Text in German) Mi $1.25, Enl Pr $1.50. PB 102459

1. Tungsten carbides - Structure - Germany 2. BIOS FR 925 LD 3. Micro BIOS HEC 11240 4. Micro BIOS FD 3845/47, Frames 1-3.

English abstract included. Abstract available as PB 102459s. 1p. Mi $1.25, Ph $1.25. Listed in BIOS FR 925 appx. I, p. 23.

ÜBER DIE LEGIERUNGSBILDUNG ZWISCHEN KOBALT UND TANTALKARBID ODER MOLYBDÄNKARBID (KOBALTREICHE LEGIERUNGEN) (STRUCTURE OF ALLOYS OF COBALT AND TANTALUM CARBIDE OR MOLYBDENUM CARBIDE (ALLOYS RICH IN COBALT), by Dr. Dawihl. Studiengesellschaft Hartmetall, Berlin. Oct 1939. 8f (Text in German) Mi $1.25, Enl Pr $2.50. PB 102450

1. Cobalt alloys - Structure - Germany 2. Tantalum carbide alloys - Structure - Germany 3. Molybdenum carbide alloys - Structure - Germany 4. BIOS FR 925 LD 5. Micro BIOS HEC 11196 6. Micro BIOS FD 3821/47, Frames 1-7.

English abstract included. Abstract available as PB 102450s. 1p. Mi $1.25, Ph $1.25. Listed in BIOS FR 925 appx. I, p. 18 as HEC 11196.

ÜBER MISCHKRISTALLBILDUNG IM SYSTEM TIC-VC (SOLID SOLUTION FORMATION IN THE TIC-VC SYSTEM), by Dr. Dawihl. Studiengesellschaft Hartmetall, Berlin. Nov 1939. 4f (Text in German) Mi $1.25, Enl Pr $1.50. PB 102453

1. Titanium carbides - Crystals - Germany 2. Vanadium carbides - Effect on metals - Germany 3. BIOS FR 925 LD 4. Micro BIOS HEC 11199 5. Micro BIOS FD 3824/47, Frames 1-3.

English abstract included. Abstract available as PB 102453s. 1p. Mi $1.25, Ph $1.25. Listed in BIOS FR 925 appx. I, p. 19.

UNTERSUCHUNGEN AN ZN-AL-CU-FORMGUSS-LEGIERUNGEN (COMPOSITION AND PROPERTIES OF ZINC-ALUMINUM-COPPER DIE CASTING ALLOYS), by A. Burkhardt, E. Gwinner, K. Lochberg and E. Schmid. Metallgesellschaft A. G., Frankfort, Ger. Jul 1941. 25f photos, drawings, graphs (Text in German) Mi $2.00, Enl Pr $5.00. PB 102384

1. Zinc-aluminum-copper alloys - Germany 2. Giesches' Erben, Georg von, Breslau, Ger. 3. Micro BIOS HEC 12236 4. Micro BIOS FD 247/48, Frames 952-976.

Abstract available as PB 102384s. 2p. Mi $1.25, Ph $1.25.

ZERSETZUNGSVERSUCH VON CALCIUMWOLFRAMAT IN DER REDUKTIONSANLAGE K (DISINTEGRATION TEST ON CALCIUM TUNGSTATE IN THE REDUCING PLANT K). Studiengesellschaft Hartmetall, Berlin. Mar 1941. 3f (Text in German) Mi $1.25, Enl Pr $1.50. PB 102431

1. Calcium tungstate - Reduction - Germany 2. BIOS FR 925 LD 3. Micro BIOS HEC 11286 4. Micro BIOS FD 3871/47, Frames 1-2.

English abstract included. Abstract available as PB 102431s. 1p. Mi $1.25, Ph $1.25. Listed in BIOS FR 925 appx. I, p. 28

ZUSAMMENFASSUNG DER JETZIGEN ANSCHAUUNG ÜBER DIE VORGÄNGE BEI DER SINTERUNG UND DEN GEFÜGEAUFBAU DER HARTMETALLEGIERUNGEN (SYNOPSIS OF MODERN IDEAS ON THE SINTERING AND STRUCTURE OF HARD METAL ALLOYS). Studiengesellschaft Hartmetall, Berlin. Oct 1940. 3f (Text in German) Mi $1.25, Enl Pr $1.50. PB 102463

1. Alloys, Hard - Sintering - Germany 2. Alloys, Hard - Structure - Germany 3. BIOS FR 925 LD 4. Micro BIOS HEC 11244 5. Micro BIOS FD 3849/47, Frames 1-3.

Listed in BIOS FR 925 appx. I, p. 23 as HEC 11244.

METEORALOGY AND CLIMATOLOGY

FREE OSCILLATIONS OF AN ATMOSPHERE IN WHICH TEMPERATURE INCREASES LINEARLY WITH HEIGHT, by C. L. Pekeris. U. S. National Advisory Committee for Aeronautics. Oct 1950. 24p graphs Mi $2.00, Ph $3.75. PB 101982

In an atmosphere where the temperature increases linearly with height at a constant rate, the acoustic propagation properties are radically different from those hitherto encountered in the theory of atmospheric tides. The phase velocity no longer approaches a limit with increasing period but increases linearly with the period. The region of maximum energy of the oscillation is shifted to increasingly higher elevations as the period is increased. The bearing of these results on the resonance theory of atmospheric tides is discussed. NACA TN 2209.

PROJECT CIRRUS. QUARTERLY PROGRESS REPORT NO. 6, PREPARED by Vincent J. Schaefer. General Electric Co., Research Laboratory, Schenectady, N. Y. Jan 1949. 3p Mi $1.25, Ph $1.25. PB 102312

1. Silver iodide 2. Rain, Simulated 3. Clouds - Formation 4. SIG Contract W-36-039-sc-38141 5. GE RL 146.

Dept. of the Army project: 3-99-07-022. Signal Corps project: 172B. 1st quarterly report under Contract W-36-039-sc-38141.

PROJECT CIRRUS. SUPPLEMENT TO QUARTERLY PROGRESS REPORT NO. 6, PREPARED by Vincent J. Schaefer. General Electric Co., Research Laboratory, Schenectady, N. Y. Mar 1949. 7p Mi $1.25, Ph $1.25. PB 102312s

1. Silver iodide 2. Rain, Simulated 3. Clouds - Formation 4. SIG Contract W-36-039-sc-38141 5. GE RL 181.

Dept. of the Army project: 3-99-07-022. Signal Corps project: 172B.

PROJECT CIRRUS. QUARTERLY PROGRESS REPORT NO. 12, PREPARED by Vincent J. Schaefer. General Electric Co., Research Laboratory, Schenectady, N. Y. Jul 1950. 8p Mi $1.25, Ph $1.25 PB 102313

1. Silver iodide 2. Rain, Simulated 3. Clouds -

Formation 4. SIG Contract W-36-039-sc-38141 5. GE RL 384.

Dept. of the Army project: 3-99-07-022. Signal Corps project: 172B. 7th quarterly report issued under Contract W-36-039-sc-38141.

PROJECT CIRRUS. OCCASIONAL REPORT NO. 22: CAUSE AND EFFECT VERSUS PROBABILITY IN SHOWER PRODUCTION, by Irving Langmuir. General Electric Co., Research Laboratory, Schenectady, N. Y. Jul 1950. 7p Mi $1.25, Ph $1.25. PB 102314

1. Silver iodide 2. Rain, Simulated 3. Clouds - Formation 4. SIG Contract W-36-039-sc-38141 5. GE RL 366.

Dept. of the Army project: 3-99-07-022. Signal Corps project: 172B.

PROJECT CIRRUS. OCCASIONAL REPORT NO. 23: A GAMMA PATTERN SEEDING OF STRATUS CLOUDS, FLIGHT 52 AND A RACETRACK PATTERN SEEDING OF STRATUS CLOUDS, FLIGHT 53, by Charles A. Woodman and Irving Langmuir. General Electric Co., Research Laboratory, Schenectady, N. Y. Jun 1950. 30p photos, diagr Mi $2.00, Ph $3.75. PB 102315

1. Clouds, Stratus - Seeding 2. SIG Contract W-36-039-sc-38141 3. GE RL 363.

Dept. of the Army project: 3-99-07-022. Signal Corps project: 172B.

PROJECT CIRRUS. OCCASIONAL REPORT NO. 24: RESULTS OF THE SEEDING OF CUMULOUS CLOUDS IN NEW MEXICO, A PARTIAL REPORT ON FLIGHT 45, by Irving Langmuir. General Electric Co., Research Laboratory, Schenectady, N. Y. Jun 1950. 23p photos Mi $2.00, Ph $3.75. PB 102316

1. Clouds, Cumulous - Seeding 2. Rain, Simulated 3. SIG Contract W-36-039-sc-38141 4. GE RL 364.

Dept. of the Army project: 3-99-07-022. Signal Corps project: 172B.

STATISTICAL EXPLANATION OF SPONTANEOUS FREEZING OF WATER DROPLETS, by Joseph Levine. U. S. National Advisory Committee for Aeronautics. Dec 1950. 27p graphs, tables Mi $2.00, Ph $3.75. PB 102407

A statistical theory based on the presence of small crystallization nuclei suspended in water is developed to explain experimental results showing that on the average small droplets can be supercooled to lower temperatures than large ones. Small nuclei of crystallization are assumed responsible for causing supercooled water to freeze spontaneously. The average behavior of supercooled droplets is reproduced on the basis of probability theory with an assumed distribution of crystallization nuclei with respect to the temperatures at which the nuclei cause freezing. The most probable distribution curves of spontaneous freezing temperatures for water droplets of various sizes within the size range found in clouds are obtained. NACA TN 2234.

MINERALS AND MINERAL PRODUCTS

AIRCRAFT MATERIAL SPECIFICATION: GLASS FABRIC. Gt. Brit. Ministry of Supply. Jul 1950. 1p. Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.15. PB 102177

1. Fabrics, Glass - Gt. Brit. 2. MS DTD MS 812.

ARBETSTIDER VID VALVFORMAR AV TRÄ (WORKING TIMES ON TIMBER FORMWORK FOR CONCRETE SLABS), by Mejse Jacobsson and Göran Bjursten. Sweden. Statens Kommittee för Byggnads forskning. 1949. 27p photos, drawings, graph, tables (Text in Swedish) Mi $2.00, Ph $3.75. PB 102021

1. Concrete - Formwork - Sweden.

Rapporter nr. 19. Contains summary in English (p. 23).

BAMBOO REINFORCEMENT IN PORTLAND CEMENT CONCRETE, by H. E. Glenn. Clemson Agricultural College of South Carolina. Engineering Experiment Station, Clemson, N. C. May 1950. 171p photos, drawings, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Limited supply Mimeo: $1.00. PB 101839

1. Concrete, Reinforced - Bamboo 2. U. S. Office of Production Research and Development.

Bulletin no. 4, May 1950. War Production Board Contract no. 78.

BV 246 VERLAUF DER AUSHAERTUNG VON MAGNESITZEMENT (HARDENING PROCESS OF MAGNESITE CEMENT), by Herr Kampa. Blohm & Voss, K. G., Hamburg, Ger. Mar 1944. 48p diagrs, drawing, graphs (Text in German) Mi $2.50, Ph $6.25. PB 102524

Magnesite cement is used for the reshaping of wings. Several magnesia mixtures were tested for the purpose of clarifying the hardening process of magnesite cement. Tests described involve either modifications in the concentration of magnesium chloride solutions or the replacement of kieselgur by sawdust. Best results were obtained by using sawdust as a filler. The compressive strength of gypsum was found to be inferior to that of magnesite cement. Blohm & Voss Report no. 246.

DETAILS RELATING TO PRODUCTION AND PROPERTIES OF TUNGSTEN METAL AND TUNGSTEN WIRE. SPECIFICATIONS FOR OSRAM INSTRUMENT AND FUSIBLE GLASS AND URDOX RESISTANCE BODIES. Osram G.m.b.H., Berlin. 1947. 16f photos, tables (Text in German and English) Mi $1.75, Enl Pr $3.75. PB 102378

1. Tungsten - Production - Germany 2. Glass, Optical - Specifications - Germany 3. V-122a (Glass) 4. Micro BIOS FD 4411/47, Frames 1-13.

English abstract included. Abstract available as PB 102378s. 2p. Mi $1.25, Ph $1.25.

DRAWINGS OF A TUNNEL KILN FOR CERAMICS PRODUCTION. Keramische Industrie Bedarfs A.G., Berlin. 1939-1940. 311f drawings (Legends in German) Mi $9.00, Enl Pr $42.50. PB 102133

1. Kilns, Ceramic - Design - Germany 2. Micro BIOS FD 365/48, Frames 1-69+142.

Abstract available as PB 102133s. 1p. Mi $1.25, Ph $1.25. List of drawings in English.

HANDBOOK OF CHEMICAL METHODS FOR THE DETERMINATION OF URANIUM IN MINERALS AND

ORES, by F. H. Burstall and A. F. Williams. Gt. Brit. Dept. of Scientific and Industrial Research. Chemical Research Laboratory. 1950. 26p drawings Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.30. PB 102347

1. Uranium - Determination - Gt. Brit.

S.O. Code no. 47-160. Companion volume to Prospector's handbook to radioactive mineral deposits (PB 97716).

VERHALTEN VON MINERALISCHEN FASERSTOFFEN GEGEN ERSCHÜTTERUNGEN (BEHAVIOR OF MINERAL FIBERS UNDER VIBRATIONS), by W. Schenker. I. G. Farbenindustrie A. G., Oppau, Ger. Mar 1943. 4f tables (Text in German) Mi $1.25, Enl Pr $1.50. PB 102367

1. Fibers, Mineral - Effect of vibration - Germany 2. Micro BIOS FD 2867/46, Item 12, Frames 1-3.

English abstract included. Abstract available as PB 102367s. 1p. Mi $1.25, Ph $1.25. Kurzbericht nr. 25. Illustrations are not included.

ORDNANCE AND ACCESSORIES

APPROXIMATE METHOD FOR ESTIMATING THE PERFORMANCE OF OXYGEN-OIL ROCKETS, by A.B.P. Beeton. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Jun 1946. 15p graphs PB 102116

A method is described which enables the operating conditions of an oxygen-oil rocket to be determined to a reasonably accurate degree. Less important components such as OH, O and H are not allowed for, but the method is otherwise exact and could be extended to cover these components. Curves are given for the total heat and entropy of the constituent gases, and for the relevant equilibrium constants. These values are used to derive the total heat entropy diagrams for four mixture ratios over a range from 1 to 60 atmospheres pressure in each case. Further curves are given which show the theoretical throat and outlet areas, and also the specific impulses for expansion down to 1 atmosphere pressure. Cover date is 1950. S.O. Code no. 23-2389. ARC RM 2389.

EXPLODERS FOR SIMULTANEOUS FIRING OF SHOTS, by G. Allsop and E. M. Guénault. Gt. Brit. Ministry of Fuel and Power. 1950. 17p diagrs, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.15. PB 101944

In this paper a short account is given of the electrical properties of low tension detonators which affect their firing when connected in series in a round of shots. It is pointed out that shotfirers ought to have an ohmmeter or some other means of knowing when the resistance of a round of shots is so high that it is unwise to attempt to fire it. S.O. Code no. 41-96-7. MFP SMRP 107.

REPORT OF THE COMMITTEE OF ENQUIRY INTO THE PRECAUTIONS NECESSARY TO SECURE SAFETY IN THE USE OF EXPLOSIVES IN COAL MINES. Gt. Brit. Ministry of Fuel and Power. 1950. 51p tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.40. PB 102043

1. Coal mines and mining - Safety measures - Gt. Brit. 2. Coal mines and mining - Use of explosives - Gt. Brit. 3. Explosives - Safety measures - Gt. Brit.

S.O. Code no. 41-124.

RESEARCH WORK ON EXPLOSIVES. Westfälisch-Anhaltische Sprengstoff A. G., Reinsdorf, Ger. 1938-1944. 244f photos, graphs, tables (Text in German) Mi $9.00, Enl Pr $32.50. PB 102061

1. Explosives - Research - Germany 2. KA salt (Trade name) 3. Salge - Bühler drying apparatus 4. Cameras, High speed - Germany 5. Micro BIOS FD 1991/46, Frames 1-237.

English abstract included. Abstract available as PB 102061s. 3p. Mi $1.25, Ph $1.25. Includes correspondence referring to a camera for photographing explosive phenomena.

ROCKET RESEARCH REPORT NO. III: VIBRATION IN THE VIKING NO. 3 ROCKET, by Chester B. Cunningham, E. E. Bissell, L.H.A. Feher, and R. W. Stroup. U. S. Naval Research Laboratory. Jul 1950. 49p photos, drawings, graphs, tables Mi $2.50, Ph $6.25. PB 102004

Vibrational frequencies and amplitudes occurring in the warhead and adjacent to the rocket motor were observed during the static firing tests and during flight of Viking No. 3 rocket. Experimental procedures and results are presented. NRL R 3695.

PACKING AND PACKAGING

EXPLANATORY SUPPLEMENT TO "STANDARDS FOR CONTAINERS FOR COMPRESSED GASES ETC. MADE FROM PURE ALUMINUM", by G. Liebegott. Aluminium-Zentrale G.m.b.H., Berlin. n.d. 50f drawings, graphs, tables (Text in German) Mi $2.50, Enl Pr $7.50. PB 102266

1. Gases, Compressed - Containers - Germany 2. Micro BIOS FD 4689/47, Frames 1-48.

English abstract included. Abstract available as PB 102266s. 2p. Mi $1.25, Ph $1.25.

PAPER AND ALLIED PRODUCTS

FINAL REPORT OF THE INVESTIGATION AND DEVELOPMENT OF FACSIMILE RECORDING PAPER, by H. R. Dalton. Timefax Corporation. Jul 1948. 15p tables Mi $1.75, Ph $2.50. PB 102317

1. Duplicating processes 2. Paper, Recording 3. SIG Contract W-36-039-sc-32106.

PERSONNEL APTITUDE TESTING

DEVELOPMENT AND CONSTRUCTION OF THE ROTC QUALIFYING EXAMINATION, RQ-3, FOR USE IN ROTC UNITS IN 1949, by Dr. H. Brandt and Bruce Berman. U. S. Adjutant General's Office. Personnel Research Section. Dec 1949. 6p tables

Mi $1.25, Ph $1.25. PB 102195

1. Ability tests 2. Reserve Officers Training Corps - Tests 3. RQ3 (Test) 4. WD AGO PRS 823.

FURTHER VALIDATION OF PHYSICAL PROFICIENCY TESTS AGAINST APTITUDE FOR SERVICE RATINGS AT WEST POINT. U. S. Adjutant General's Office. Personnel Research Section. Dec 1949. 11p tables Mi $1.75, Ph $2.50. PB 102196

1. Ability tests 2. Physical fitness - Tests 3. WD AGO PRS 828.

PREPARATION OF A BATTERY OF PHYSICAL PROFICIENCY MEASURES FOR CLASSIFICATION, by Eva Russell. U. S. Adjutant General's Office. Personnel Research Section. Feb 1950. 5p Mi $1.25, Ph $1.25. PB 102194

1. Personnel - Classification 2. Physical fitness - Tests 3. WD AGO PRS 820.

PHOTOGRAPHIC AND OPTICAL GOODS

MEASUREMENT OF AIRCRAFT HEIGHT AND SPEED IN HIGH SPEED DIVES BY A POTOGRAPHIC METHOD AND BY RADAR TRACKING, by D. W. Lang and W. J. Charnley. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Jan 1946. 16p photos, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.75. PB 102113

This report describes flight tests made to find alternative methods of measuring aircraft height and speed at high speeds other than by the aircraft pitot-static system. Two such methods are discussed. 1. Height alone may be obtained from a camera in the aircraft photographing the ground, by comparing the picture taken with a map of the same area. The accuracy is not good, being on the average about +2 per cent. in altitude, so the method would only serve as a rough guide to the order of the altitude. A comparison with aircraft auto-observer results is shown. 2. An S.C.R. 584 Radar van used to track the aircraft gives speed as well as height and appears much more promising. Height can be determined to within 400 ft., which appears as a constant difference, and airspeed to within 7 m.p.h. up to a Mach number of 0.76. Mach number can therefore be determined to within 1 1/2 per cent., an accuracy which need not decrease at even higher speeds. Speed, altitude and angle of dive are compared with auto-observer readings, and results from low-speed tracking are also included. Cover date is 1950. S.O. Code no. 23-2351. ARC RM 2351.

MULTIPLE-FILM BACK-REFLECTION CAMERA FOR ATOMIC STRAIN STUDIES, by Anthony B. Marmo. U. S. National Advisory Committee for Aeronautics. Nov 1950. 19p photos, diagrs Mi $1.75, Ph $2.50. PB 102288

A multiple-film back-reflection camera was designed and a new technique devised to allow more accurate X-ray diffraction analysis of diffuse as well as sharp diffraction patterns. Necessity of measuring film-to-specimen distance was eliminated and other limitations of conventional back-reflection methods reduced by the new technique. An accuracy of $\pm 4 \times 10^{-5}$ A was obtained in determining the atomic spacing of the 420 planes in gold from rather diffuse patterns. Comparison between a conventional two-exposure stress study and an atomic strain analysis of SAE X4130 steel by the multiple-film technique showed that atomic strain acceptance is not necessarily consistent with macroscopic elastic behavior. NACA TN 2224.

PHOTOGRAVURE AND METAL PRINTING MACHINES Mailänder, T. G., Stuttgart, Ger. 1931-1939. 108f photos, drawings (Text in German and English) Mi $4.50; Enl Pr $15.00. PB 102427

1. Machines, Photogravure - Germany 2. Machines Metal printing - Germany 3. Micro BIOS FD 3127/47, Frames 1-67+37.

English abstract included. Abstract available as PB 102427s. 2p. Mi $1.25, Ph $1.25. Some frames will not reproduce well. Firm is referred to in BIOS FR 401, p. 50-51.

RESEARCH DIRECTED TOWARD THE DEVELOPMENT OF ACCLIMATIZED SILVER HALIDE FILM. QUARTERLY REPORT NO. 3, OCT 15, 1948 TO JAN 15, 1949. FRACTIONATION OF CELLULOSE DERIVATIVES AND RELATED STUDIES, by K. F. Beal. Armour Research Foundation, Chicago, Ill. Feb 1949. 22p tables Mi $2.00, Ph $3.75. PB 102289

1. Silver halides - Research 2. Films (Photography)-Base materials 3. Cellulose - Derivatives - Fractionation 4. SIG Contract W36-039-sc-36833, Report 3.

Armour project no. 90-594C; Dept. of the Army project: 3-99-04-052; Signal Corps project: 195B. For 4th-8th (final) reports see PB 102290-102294.

RESEARCH DIRECTED TOWARD THE DEVELOPMENT OF ACCLIMATIZED SILVER HALIDE FILM. QUARTERLY REPORT NO. 4, JAN 15, 1959 TO APR 15, 1949. CELLULOSE DERIVATIVES, by K. F. Beal. Armour Research Foundation, Chicago, Ill. May 1949. 24p graph, tables Mi $2.00, Ph $3.75. PB 102290

1. Silver halides - Research 2. Films (Photography), Base materials 3. Cellulose - Derivatives - Synthesis 4. SIG Contract W36-039-sc-36833, Report 4.

Armour project no. 90-594C; Dept. of the Army project: 3-99-04-052; Signal Corps project: 195B. For 3d, 5th-8th (final) reports see PB 102289, PB 102291-102294.

RESEARCH DIRECTED TOWARD THE DEVELOPMENT OF ACCLIMATIZED SILVER HALIDE FILM. QUARTERLY REPORT NO. 5, APR 15, 1949 TO JULY 15, 1949. CELLULOSE ETHERS, PHYSICAL TEST DATA AND NEW FILM TESTING EQUIPMENT by K. F. Beal. Armour Research Foundation, Chicago, Ill. Aug 1949. 22p photo, graphs, tables Mi $2.00, Ph $3.75. PB 102291

1. Silver halides - Research 2. Films (Photography) - Base materials 3. Cellulose ethers - Tests 4. Cellulose ethers - Testing equipment 5. SIG Contract W36-039-sc-38633, Report 5.

Armour project no. 90-594C; Dept. of the Army project: 3-99-04-052; Signal Corps project: 195B For 3d-4th, 6th-8th (final) reports see PB 102289-102290, 102292-102294.

RESEARCH DIRECTED TOWARD THE DEVELOPMENT OF ACCLIMATIZED SILVER HALIDE FILM. QUARTERLY REPORT NO. 6, JULY 15, 1949 TO OCT 15, 1949. MIXED ETHERS OF CELLULOSE THEIR SYNTHESIS AND PHYSICAL PROPERTIES, by K. F. Beal. Armour Research Foundation, Chicago, Ill. Nov 1949. 30p graphs, tables Mi $2.00, Ph $3.75. PB 102292

1. Silver halides - Research 2. Films (Photography) - Base materials 3. Cellulose ethers - Synthesis 4. Cellulose ethers - Physical properties 5. SIG Contract W36-039-sc-38633, Report 6.

Armour project no. 90-594C; Dept. of the Army project: 3-99-04-052; Signal Corps project: 195B. For 3d-5th, 7th-8th (final) reports see PB 102289-102291, 102293-102294.

RESEARCH DIRECTED TOWARD THE DEVELOPMENT OF SILVER HALIDE FILM. QUARTERLY REPORT NO. 7, OCT 14, 1949 TO JAN 15, 1950. CELLULOSE ETHERS: SYNTHESIS, MODIFICATION AND COMPATIBILITY STUDIES. SILVER HALIDE-GELATIN EMULSION COATING OF FILM BASES, by K. F. Beal. Armour Research Foundation, Chicago, Ill. Feb 1950. 22p graphs, tables Mi $2.00, Ph $3.75. PB 102293

1. Silver halides - Research 2. Films (Photography) - Base materials 3. Cellulose ethers - Synthesis 4. Films (Photography) - Coatings 5. SIG Contract W36-039-sc-38633, Report 7.

Armour project no. 90-594C; Dept. of the Army project: 3-99-04-052; Signal Corps project: 195B. For 3d-6th, 8th (final) reports see PB 102289-102292, 102294.

RESEARCH DIRECTED TOWARD THE DEVELOPMENT OF ACCLIMATIZED SILVER HALIDE FILM. FINAL REPORT, PERIOD APR 15, 1948 TO APR 15, 1950, by K. F. Beal. Armour Research Foundation, Chicago, Ill. Apr 1950. 66p photo, graphs, tables Mi $3.00, Ph $8.75. PB 102294

1. Silver halides - Research 2. Films (Photography) - Base materials 3. Films (Photography) - Low temperature 4. Cellulose - Derivatives - Synthesis 5. Cellulose ethers - Synthesis 6. SIG Contract W-36-039-sc-38633, final report.

Armour project no. 90-594C; Dept. of the Army project: 3-99-04-052; Signal Corps project: 195B. For 3d-7th reports see PB 102289-102293.

SPEZIALOSCILLOGRAPH MIT ABLAUFKAMERA (MOVING-COIL OSCILLOGRAPH WITH HIGH-SPEED CAMERA). Berliner Physikalische Werkstatten G.m.b.H., Berlin. n.d. 18f photos, diagr (Text in German) Mi $1.75, Enl Pr $3.75. PB 102067

1. Oscillographs, Moving coil - Germany 2. Cameras, High speed - Germany 3. Micro BIOS FD 4389/47, Frames 1-17.

English abstract included. Abstract available as PB 102067s. 1p. Mi $1.25, Ph $1.25.

PHYSICS

General

ANALYTICAL INVESTIGATION OF TURBULENT FLOW IN SMOOTH TUBES WITH HEAT TRANSFER WITH VARIABLE FLUID PROPERTIES FOR PRANDTL NUMBER OF 1, by Robert G. Deissler. U. S. National Advisory Committee for Aeronautics. Dec 1950. 39p graphs Mi $2.25, Ph $5.00. PB 102507

Equations were derived for the prediction of radial-velocity and temperature distributions for fully developed turbulent flow of gases in smooth tubes for the case where the variation of fluid properties due to temperature variation across the tube is appreciable. By use of these equations, relations were obtained among Nusselt number, Reynolds number, and friction factor for a fluid with a Prandtl number of 1. The analysis indicated that the effect of variation of gas properties on the Nusselt number and friction-factor correlations for both heating and cooling of the gas can be eliminated by evaluating the gas properties at a temperature close to the average of the wall and bulk temperatures. NACA TN 2242.

CALCULATION OF COMPRESSIBLE POTENTIAL FLOW PAST SLENDER BODIES OF REVOLUTION BY AN INTEGRAL METHOD, by Milton M. Klein and W. Perl. U. S. National Advisory Committee for Aeronautics. Dec 1950. 54p graphs, tables Mi $2.75, Ph $7.50. PB 102505

An integral method, previously used to obtain compressible flow past two-dimensional shapes, is applied to the calculation of compressible potential flow past slender bodies of revolution. Good agreement of the resulting velocities on ellipsoids of revolution with those obtained by other methods was found. Flow-field conditions, in particular, local supersonic regions, are calculated and discussed. The free-stream Mach number beyond which a continous potential-flow solution ceases to exist is found to be very close to 1. NACA TN 2245.

FLUTTER, by E. P. Grossman. May 1949. 402p diagrs, graphs, tables Mi $9.00, Ph $52.25. PB 102532

1. Brown University. Graduate Division of Applied Mathematics, tr. 2. Flutter - Research - Russia 3. U. S. Air Materiel Command, Wright-Patterson Air Force Base, Dayton, Ohio 4. AAF TR F-TS 1225-IA (GDAM A9-T-44) 5. AAF T-2 T/1225.

Translation from the Russian by the Graduate Division of Applied Mathematics, Brown University, for United States Air Force, Air Materiel Command, Air Documents Division (MCIDXD), Wright Patterson Air Force Base, Dayton, Ohio. (GDAM A9-T-44).

METHOD FOR DETERMINING DISTRIBUTION OF LUMINOUS EMITTERS IN CONE OF LAMINAR BUNSEN FLAME, by Thomas P. Clark. U. S. National Advisory Committee for Aeronautics. Jan 1951. 28p diagrs, graphs Mi $2.00, Ph $3.75. PB 102562

A photographic method is presented for determining the absolute distribution in the reaction zone of a flame of luminous diatomic free radicals such as carbon C_2. The absolute distribution and the thickness of the luminous reaction zone for the C_2 radical were determined. NACA TN 2246.

SECOND SOUND VELOCITY IN HELIUM II, by R. D. Maurer and Melvin A. Herlin. Massachusetts Institute of Technology. Research Laboratory of

Electronics, Cambridge, Mass. Jun 1949. 6p graphs, table Mi $1.25, Ph $1.25. PB 102188

Pulse methods are applied to extend the measurements of second sound velocity in liquid helium II to a temperature of 0.86°K. The rise in velocity below 1.1°K observed by Peshkov is verified and extended to lower temperature, If it is true that the superfluid liquid has a rigorously vanishing entropy, the cooling method based on the thermomechanical effect should prove a powerful means for reaching low temperatures. Other theoretical implications are discussed. MIT RLE TR 124.

PSYCHOLOGY

HISTORICAL BACKGROUND AND ORGANIZATION OF THE PILOT CANIDATE SELECTION RESEARCH PROGRAM, REPORT by Howard E. Page. U. S. Air Force. School of Aviation Medicine, Randolph Field, Tex. and U. S. Naval School of Aviation Medicine, Naval Air Station, Pensacola, Fla. Mar 1950. 36p Mi $2.25, Ph $5.00. PB 101956

Data covered are: Historical background, the project as finally conceived, organization for the research project, and responsibilities assumed. Appendices: (A) Official correspondence, (B) minutes of conferences, and (C) participants in the project. Joint project report no. 1 on USAF School of Aviation Medicine project no. 21-02-063 and Naval School of Aviation Medicine project no. NM 001057.04.01.

INVESTIGATION OF CERTAIN AFTEREFFECTS OF INTERMITTENT RADIAL ACCELERATION, by R. C. Wilson, G. A. Green, G. L. Bryan, N. E. Willmorth, N. D. Warren. University of Southern California. Psychological Laboratory. Oct 1950. 18p tables Mi $1.75, Ph $2.50. PB 101998

Factual and experimental data and conclusions are given. The subjects were divided into experimental and control groups. The experimental group was subjected to 3 g's for one minute every eight minutes for a total of 7 minutes. The same exposure schedule was employed for the control group except that the g intensity was 1 1/2. Bibliography and tables attached. Reports no. II. Psychological research on the human centrifuge. Report no. 8.

SINGLE-TRIAL-PER-TASK VERSUS MULTIPLE-TRIALS-PERTASK IN THE ACQUISITION OF SKILL IN PERFORMING SEVERAL SIMILAR TASKS. (HUMAN ENGINEERING SYNTHESIS OF BASIC INFORMATION). REPORT PREPARED by Dorothy E. McAllister and Don Lewis. Iowa State University, Iowa City, Iowa. Aug 1950. 18p photos, graphs Mi $1.75, Ph $2.50. PB 102044

1. Psychomotor tests 2. SDC TR 938-1-7.

SDC Human engineering project 20-M-1e. Contract N9onr-93801. Project designation NR-783-007.

RUBBER AND RUBBER PRODUCTS

CHLORIERTE KOHLENWASSERSTOFFEN ALS REGLER (CHLORINATED HYDROCARBONS AS REGULATORS), by Schneider. I. G. Farbenindustrie A. G., Leverkusen, Ger. Jul 1944. 5f graphs, tables (Text in German) Mi $1.25, Enl Pr $1.50. PB 102391

1. Hydrocarbons, Chlorinated - Use as regulators - Germany 2. Polymerization - Regulators - Germany 3. KAUTEKO (Anwendungstechnische Kommission für Kautschuk) 4. Micro BIOS FD 1397/48, Frames 1-5.

Abstract available as PB 102391s. 2p. Mi $1.25, Ph $1.25. Paper submitted to Scientific Rubber Committee July 31, 1944. Some frames will not reproduce well.

EINFLUSS DER VINYLKOMPONENTE AUF DIE MECHANISCHEN EIGENSCHAFTEN VON VULCANISATEN AUS KONZENTRIERTEN BUNA-LATTICES (INFLUENCE OF THE VINYL CONSTITUENT ON THE MECHANICAL PROPERTIES OF CONCENTRATED BUNA LATEX VULCANIZATION PRODUCTS), by Dr. Logemann. I. G. Farbenindustrie A. G., Leverkusen, Ger. May 1941. 18f drawings, graphs, tables (Text in German) Mi $1.75, Enl Pr $3.75. PB 102390

1. Igetex N (Trade name) 2. Rubber, Buna - Polymerization - Germany 3. KAUTEKO (Anwendungstechnische Kommission für Kautschuk) 4. Micro BIOS FD 1342/48, Frames 1-18.

Abstract available as PB 102390s. 1p. Mi $1.25, Ph $1.25. Paper submitted to Scientific Rubber Committee May 1941.

GASPHASEPOLYMERISATION MIT ALKALIMETALLEN (GAS PHASE POLYMERIZATION WITH ALKALI METALS), by Ebert. I. G. Farbenindustrie A.G., Ludwigshafen, Ger. Feb 1942. 11f photos (Text in German) Mi $1.75, Enl Pr $3.75. PB 102340

1. Polymerization, Gas phase - Germany 2. Metals, Alkali - Use in Buna polymerization - Germany 3. KAUTEKO (Anwendungstechnische Kommission für Kautschuk) 4. Micro BIOS FD 1463/48, Frames 1-9.

English abstract included. Abstract available as PB 102340s. 2p. Mi $1.25, Ph $1.25. Paper submitted to 9th meeting of Scientific Rubber Committee, Feb 1942.

HOCHDRUCK-POLYMERISATION (HIGH PRESSURE POLYMERIZATION), by Holzrichter. I. G. Farbenindustrie A.G., Leverkusen, Ger. Feb 1941. 9f (Text in German) Mi $1.25, Enl Pr $2.50. PB 102337

1. Polymerization, High pressure - Germany 2. KAUTEKO (Anwendungstechnische Kommission für Kautschuk) 3. Micro BIOS FD 1337/48, Frames 1-7.

English abstract included. Abstract available as PB 102337s. 2p. Mi $1.25, Ph $1.25. Submitted to Scientific Rubber Conference May 1941.

KONTINUIERLICHE DURCHFÜHRUNG VON SCHNELLVERLAUFENDEN POLYMERISATIONSANSÄTZEN (CONTINUOUS PROCESS OF RAPID POLYMERIZATION), by Dr. Mühlhausen. I. G. Farbenindustrie A. G., Leverkusen, Ger. Jul 1944. 8f tables (Text in German) Mi $1.25, Enl Pr $2.50 PB 102339

1. Polymerization, Emulsion - Methods - Germany 2. KAUTEKO (Anwendungstechnische Kommission für Kautschuk) 3. Micro BIOS FD 1407/48, Frames 1-6.

English abstract included. Abstract available as

PB 102339s. 2p. Mi $1.25, Ph $1.25. Paper submitted to Scientific Rubber Conference 31 July, 1944.

NEUERE ARBEITEN ÜBER DIE AKTIVIERUNG DER EMULSIONS-POLYMERISATION OHNE SAUERSTOFFABGEBENDE VERBINDUNGEN (RECENT WORK ON THE ACTIVATION OF EMULSION POLYMERIZATION WITHOUT OXIDIZING COMPOUNDS), by Dr. Garten. I. G. Farbenindustrie A. G., Leverkusen, Ger. Jul 1944. 17f tables (Text in German) Mi $1.75, Enl Pr $3.75. PB 102392

1. Polymerization, Emulsion - Research - Germany 2. KAUTEKO (Anwendungstechnische Kommission für Kautschuk) 3. Micro BIOS FD 1409/48, Frames 1-17.

Abstract available as PB 102392s. 2p. Mi $1.25, Ph $1.25. Paper submitted to Scientific Rubber Committee July 31, 1944. Some frames will not reproduce well.

PNEUMATIC TYPE MANUFACTURING INDUSTRY, by A. J. Norval, W.F.J. Steenkamp, A. A. Moore, Harry A. Levy, F.J.C. Cronje. Union of South Africa. Board of Trade and Industries. Dec 1949. 134p tables (part fold). Mi $5.50, Ph $17.50. PB 102124

1. Tires, Pneumatic - Manufacture - Union of South Africa.

Report no. 318.

REVIEW OF THE WORK DONE BY T.K.V. (COMMITTEE FOR TECHNICAL UTILIZATION OF RUBBER), by H. Rölig. I. G. Farbenindustrie A. G., Leverkusen, Ger. Dec 1942. 22f photos, drawings, graphs (Text in German) Mi $2.00, Enl Pr $5.00. PB 102057

1. Rubber, Buna - Testing equipment - Germany 2. Rubber, Buna - Uses - Germany 3. KAUTEKO (Anwendungstechnische Kommission für Kautschuk) 4. Technische Kautschuk Verwertung 5. Micro BIOS FD 1455/48, Frames 1-21.

English abstract included. Abstract available as PB 102057s. 1p. Mi $1.25, Ph $1.25. Paper submitted to Kauteko Dec 15, 1942.

ÜBER DEN ZUSAMMENHANG VON PERSULFATZERFALL- UND RAUMZEIT AUSBEUTE (CONNECTION BETWEEN PERSULPHATE DECOMPOSITION AND SPACE-TIME YIELD), by Franke. I. G. Farbenindustrie A. G., Schkopau, Ger. Jun 1940. 7f tables (Text in German) Mi $1.25, Enl Pr $2.50. PB 102336

1. Potassium peropydisulfate - Decomposition - Germany 2. KAUTEKO (Anwendungstechnische Kommission für Kautschuk) 3. Micro BIOS FD 1308/48, Frames 1-5.

English abstract included. Abstract available as PB 102336s. 2p. Mi $1.25, Ph $1.25. Submitted to Scientific Rubber Conference, Jun 15, 1940.

ÜBER DIE HYDRIERUNG VON VINYLACETYLEN ZU BUTADIEN MITTELST ZINKSTAUB UND LAUGE (HYDROGENATION OF VINYL ACETYLENE TO BUTADIENE BY MEANS OF ZINC POWDER AND CAUSTIC SODA SOLUTION), by Dr. Reppe. I. G. Farbenindustrie A. G., Ludwigshafen, Ger. Jan 1948. 5f (Text in German) Mi $1.25, Enl Pr $1.50. PB 102389

1. 1-Buten-3-yne - Hydrogenation - Germany 2. KAUTEKO (Anwendungstechnische Kommission für Kautschuk) 3. Micro BIOS FD 1257/48, Frames 1-5.

Abstract available as PB 102389s. 1p. Mi $1.25, Ph $1.25. Paper submitted to Scientific Rubber Committee Jan 14, 1948.

ULTRAZENTRIFUGE UND ÜBER MIKROSKOP, APPARATE UND METHODEN BEI DER BUNA-LATEX UNTERSUCHUNG (ULTRACENTRIFUGE AND ELECTRON MICROSCOPE, EQUIPMENT AND METHODS FOR THE EXAMINATION OF BUNA LATEX), by Dr. Kircher and Dr. Wolz. I. G. Farbenindustrie A. G., Leverkusen, Ger. Jul 1943. 17f photos, diagrs, graphs (Text in German) Mi $1.75, Enl Pr $3.75. PB 102338

1. Centrifuges, Ultra - Germany 2. Microscopes, Electron - Germany 3. Particles - Size - Determination - Germany 4. KAUTEKO (Anwendungstechnische Kommission für Kautschuk) 5. Micro BIOS FD 1383/48, Frames 1-15.

English abstract included. Abstract available as PB 102338s. 2p. Mi $1.25, Ph $1.25. Reports presented at Scientific Rubber Conference July 22, 1943.

STRUCTURAL ENGINEERING

ANALYSIS OF PLANE-STRESS PROBLEMS WITH AXIAL SYMMETRY IN STRAIN-HARDENING RANGE, by M. H. Lee Wu. U. S. National Advisory Committee for Aeronautics. Dec 1950. 79p drawings, graphs Mi $3.50, Ph $10.00. PB 102412

A method, based on the deformation theory and employing the finite-strain concept, was developed to solve plane-stress problems in the strain hardening range of circular membrane, rotating disk, and infinite plate with circular hole. Distributions of octahedral shear strain, as well as principal stresses and strains, were obtained. Results show that: (1) Ratios of principal stresses remain essentially constant during loading; (2) distributions of strain in the plastic case are less uniform than in the elastic case, although distributions of stress are more uniform; (3) the deformation that can be accepted by the member depends mainly on the maximum octahedral shear strain of the material; and (4) the added load that the member can sustain between the onset of yielding and failure depends on octahedral shear stress-strain relation of the material. NACA TN 2217.

ELASTIC TORSION IN THE PRESENCE OF INITIAL AXIAL STRESS, by J. N. Goodier. Stanford University. Dept. of Mechanical Engineering, Stanford, California. Nov 1948. 25p Mi $2.00, Ph $3.75. PB 102503

The torsional buckling of compressed bars of thin-walled open sections demonstrates that the torsional stiffness can be diminished to the vanishing point by thrust. An axial stress varying over the cross section may increase or diminish it according to the variation of the stress and the shape of the section. A solution is given for small torsion in the presence of initial axial stress of arbitrary distribution over

the section. The solution is analogous to that of Saint-Venant for pure torsion, but the end loads required to maintain it differ from a simple combination of the initial axial stress and the Saint-Venant torque. An expression is found for the torsional rigidity, which agrees with that derivable in a simple manner from a hypothesis used by H. Wagner in his theory of torsional buckling due to compression. The case of the initial axial stress due to bending which has applications in lateral buckling, is considered in detail. Technical report no. 1. Navy Contract N6-ONR-251 Task order XII (NR-035-241).

ENTWICKLUNG EINES GLÜKSTOFFES MIT LANGDAUERNDER GERINGER WÄRMEABGABE (DEVELOPMENT OF A RADIANT HEAT MATERIAL), by H. Leib. I. G. Farbenindustrie A. G., Ludwigshafen, Ger. Mar 1943. 22f photos, graphs, tables (Text in German) Mi $2.00, Enl Pr $5.00.
PB 102495

1. Heat, Radiant - Materials - Germany 2. Micro BIOS FD 2866/46, Item 61, Frames 9078-9098.

Abstract available as PB 102495s. 2p. Mi $1.25, Ph $1.25. Bericht des Technischen Proefstandes Oppau nr. 536.

EXPERIMENTAL STUDY OF THE TRANSVERSE IMPACT OF A MASS ON A COLUMN, by William H. Hoppmann, 2nd. Johns Hopkins University. Dept. of Mechanical Engineering. Jun 1949. 23p photos, drawings, graphs, tables Mi $2.00, Ph $3.75.
PB 102519

Results are given of an experimental investigation of the response of columns to the force of impact from a solid sphere. Three columns were tested. The length was 28-1/2 in. for each but the 1/r ratio was different. The columns were simply supported and the sphere collided at mid-height. Measurements were made of strain and deflection with various axial loads applied to the columns. The results are given in tabular form as well as by means of curves representing the ratio of stress at a given axial load to stress at zero axial load plotted against the ratio of axial load to the Euler load. Comparison is made between theoretical and experimental results. Technical report no. 2. Navy Contract N6-ONR-243 Task order VIII (NR-035-215).

PHOTO-ELASTIC EXAMINATION OF LOCAL STRESS VARIATIONS, BY W.A.P. FISHER. PART I: PHOTO-ELASTIC EXAMINATION OF LOCAL STRESS VARIATIONS IN TENSION MEMBERS OF RECTANGULAR CROSS SECTION IN THE NEIGHBOURHOOD OF RIVETS. PART II: PHOTO-ELASTIC DETERMINATION OF SHEAR LOAD IN BOLTS BY MEANS OF THE "FREEZING" METHOD. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Feb 1946. 19p photos, drawings Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $1.00. PB 102323

The disturbance of the stress field by rivets in main structural members of aircraft, e.g. spar booms, may cause strain gauges to give a misleading indication of the stresses outside the immediate area which they cover. The data provided here from photo-elastic examination of several typical cases of stress disturbance are intended for application whenever strain-gauges are used in estimating the resultant tension in members during loading tests. Cover date is 1950. S.O. Code no. 23-2378. ARC RM 2378.

PLASTIC INSTABILITY OF PLATES, by N. Grossman. Republic Aviation Corp., Farmingdale, L. I., N. Y. Jun 1948. 10p graphs, table Mi $1.25, Ph $1.25. PB 102502

A unified theory of plastic buckling applicable to both columns and plates is discussed. It is shown that columns that bend without twisting require the tangent modulus, while long flanges that twist without appreciable bending conform to the secant modulus. Plates which both bend and twist require a combination of the two moduli. The theory gives lower values for critical stress above the proportional limit than the secant modulus method for long plates with either simply supported or clamped edge conditions. It is believed that the accuracy of the method may be improved if the plastic value of Poisson's Ratio is used. ERMR-785. Will not reproduce well.

PROCEEDINGS, AT A & M COLLEGE OF TEXAS, COLLEGE STATION, TEX., APRIL 26-28, 1948. Air Conditioning Conference, 4th, 1948. Jan 1949. 157p diagrs, graphs, tables Available from Texas Engineering Experiment Station, College Station, Texas.
PB 102308

1. Air conditioning 2. TU EES B 110.

Texas Engineering Experiment Station. Bulletin 110. Agricultural and Mechanical College of Texas. Bulletin ser. 5, v. 5, no. 1, Jan 1, 1949.

SMALL BENDING AND STRETCHING OF SANDWICH-TYPE SHELLS, by Eric Reissner. U. S. National Advisory Committee for Aeronautics. May 1947. 29p drawings Available from Supt. of Documents, U. S. Government Printing Office, Washington 25, D. C. $.25. PB 102255

This theory is an extension of the known theory of homogenous thin elastic shells. It was found that two effects are important in the present problem, which are not normally of importance in the theory of curved shells: (1) The effect of transverse shear deformation and (2) the effect of transverse normal stress deformation. The general results of this report have been applied to the solution of problems concerning flat plates, circular rings, circular cylindrical shells, and spherical shells. The results of this investigation indicate the necessity of taking account of transverse shear and normal stress in sandwich-type shells, as soon as there is an order-of-magnitude difference between the elastic constants of the core layer and of the face layers of the composite shell. Solutions of problems in the present theory may in general be obtained by mathematical methods which are similar to those employed in the theory of plates and shells without the effect of transverse shear and normal stress deformation included. Cover date is 1950. NACA Report 975.

STRESS AND DISTORTION ANALYSIS OF A SWEPT BOX BEAM HAVING BULKHEADS PERPENDICULAR TO THE SPARS, by Richard R. Heldenfels, George W. Zender and Charles Libove. U. S. National Advisory Committee for Aeronautics. Nov 1950. 89p photo, drawings, graphs, tables Mi $3.75, Ph $11.25.
PB 102254

A method is presented for the approximate calculation of the stresses and distortions in a box beam representing the main structural component of a swept wing with a carry-through section and with bulkheads perpendicular to the spars. The application of the method is illustrated by a numerical example and

its results are compared with previously published test data. NACA TN 2232.

TEXTILES AND TEXTILE PRODUCTS

EFFECT OF VARIATION OF AIR DENSITY AND TEMPERATURE ON THE AIRFLOW CHARACTERISTICS OF POROUS FABRICS, by J. Picken. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Aug 1949. 21p photo, graphs, table Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.45. PB 102346

This note describes a series of tests made at low air densities and temperatures and establishes that the airflow through porous fabrics obeys the laws of dynamic similarity. Cover date is 1950. S.O. Code no. 23-9006-25. Technical note M.E. 38. ARC CP 25.

POROUS PROPERTIES OF VARIOUS MATERIALS LIKELY TO BE USED FOR MAKING PARACHUTES, by W. D. Brown and J. F. Holford. Gt. Brit. Ministry of Supply. Aeronautical Research Council. Mar 1949. 21p photos, graphs, tables Available from British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. $.45. PB 102345

An investigation has been made into the porous properties of paper perforated with round holes, and ribbon meshes with square interspaces. It has been established that the relationship between porosity and the porous area is almost linear for all materials. An approximately straight line law exists between the logarithm of the porosity and the logarithm of the pressure difference across the sample being tested, whether that sample is a woven fabric or a ribbon mesh. Woven fabrics of natural fibres have a higher index value than woven fabrics of artificial fibers. Cover date is 1950. S.O. Code no. 23-9006-24. Technical note M.E. 31. ARC CP 24.

RELATIONSHIP BETWEEN THE STRUCTURAL GEOMETRY OF TEXTILE FABRICS AND THEIR PHYSICAL PROPERTIES. PART II. ABRASION RESISTANCE, by Stanley Backer. U. S. Office of the Quartermaster General. Military Planning Division. Research and Development Branch. Sep 1949. 96p photos, graphs, tables Available from Office of Technical Services, U. S. Dept. of Commerce, Washington 25, D. C. Mimeo: $2.50. PB 102228

1. Textiles - Physical properties 2. Textiles - Abrasion resistance 3. QMC TSR 61.

For Part 1 see PB 95956.

TRANSPORTATION EQUIPMENT

Aeronautics

Aircraft

AERODYNAMIC SHAPE OF THE WING TIPS, by Dr. Sighard Hoerner. U. S. Air Materiel Command, Wright Field, Dayton, Ohio. n.d. 18p photo, drawings (part fold), graphs Mi $1.75, Ph $2.50. PB 102110

The author studied the aerodynamic characteristics of wing tips, and experimental investigations concerning the mechanism of the tip vortices and the lift/drag ratio of a wing fitted with several differently shaped tip caps. There are two ways in which the wing tips affect flow and forces on a wing: (a) Considering the tip vortices the effective span of a wing does not coincide with the geometrical span; that is, the geometrical location of the tip vortices depends upon the shape of the wing tips. (b) Some parasite drag originates from the wing tips, its amount also depending upon the shape of the tip caps. The main results of the tests as mentioned, are presented in this report, and the optimum wing-tip shape (No. 5) is described in Figure 9. This tip cap has a sharp side edge, its plane form shows a corner at the trailing edge and its upper surface extends approximately straight to the end. Employing this kind of wing tip the climbing speed is increased in the order of 1 ft/sec and the range by 1 or 2%, in comparison to disadvantageous tip shapes. AAF TR 5752.

AIRFOILS PROFILES FOR MINIMUM PRESSURE DRAG AT SUPERSONIC VELOCITIES: GENERAL ANALYSIS WITH APPLICATION TO LINEARIZED SUPERSONIC FLOW, by Dean R. Chapman. U. S. National Advisory Committee for Aeronautics. Jan 1951. 38p diagrs, graphs Mi $2.25, Ph $5.00. PB 102608

A derivation is presented of the basic equations which determine the supersonic airfoil profile having minimum pressure drag for certain prescribed structural requirements. The basic equations are applicable to a variety of practical structural requirements, and can be used with either linear, second-order, or shock-expansion airfoil theory. A solution of the basic equations is found in closed form using linear airfoil theory. The results show that in most cases the optimum profile has a blunt trailing edge. The optimum distribution of thickness depends on the Mach number, airfoil-thickness ratio, and base pressure coefficient. The pressure drag of the optimum profile is compared to that of the biconvex and double-wedge profiles. A graphical method of determining an optimum airfoil is developed and applied to several examples. NACA TN 2264.

APPROXIMATE THEORY OF HEAVILY LOADED, FREE-RUNNING PROPELLERS IN THE OPTIMUM CONDITION, by Herman Lerbs. 1949 or 1950. 65p drawings, graphs (part fold) Mi $3.00, Ph $8.75. PB 102283

1. Propeller theory.

BALSA-DUST TECHNIQUE FOR AIR-FLOW VISUALIZATION AND ITS APPLICATION TO FLOW THROUGH MODEL HELICOPTER ROTORS IN STATIC THRUST, by Marion K. Taylor. U. S. National Advisory Committee for Aeronautics. Nov 1950. 28p photos, diagrs Mi $2.00, Ph $3.75. PB 102286

A simple method of visualizing air-flow patterns in one plane is described. Results obtained with model helicopter rotors in static thrust in both steady-state and transient-flow conditions are presented for several rotor configurations with and without ground effect. NACA TN 2220.

COMPARATIVE EVALUATION OF PICTORIAL AND SYMBOLIC VOR NAVIGATION DISPLAYS IN THE 1-CA-1 LINK TRAINER, by S. N. Roscoe, J. F. Smith, B. E. Johnson, P. E. Dittman, A.C. Williams, Jr. Illinois. University. Oct 1950. 108p drawings,

diagrs, tables Mi $4.50, Ph $13.75. PB 102282

1. 1-CA-1 (Link trainer) 2. VOR (Omi-directional radio range) 3. Radio direction finders (VOR) 4. Navigation, Aerial - Training devices 5. U. S. Bureau of Medicine and Surgery. Division of Aviation Medicine 6. U. S. Civil Aeronautics Administration 7. NRC CAP 10.

Also issued as Civil Aeronautics Administration, Division of Research Report no. 92. Contract N7onr-291, Task order IX. Continues research reported in PB 99799.

COMPARISON OF THE LATERAL CONTROLLABILITY WITH FLAP AND PLUG AILERONS ON A SWEPTBACK-WING MODEL HAVING FULL-SPAN FLAPS, by Powell M. Lovell, Jr. U. S. National Advisory Committee for Aeronautics. Dec 1950. 22p drawings, graphs, table Mi $2.00, Ph $3.75. PB 102510

A free-flight-tunnel investigation has been made to compare the dynamic lateral control characteristics provided by step plug ailerons with those provided by conventional flap ailerons on a sweptback-wing model having full-span flaps. The model had a 38° sweptback wing with an aspect ratio of 3 and a taper ratio of 0.5. The static stability and control characteristics of the flight-test model were determined from force tests and the time-lag characteristics of the ailerons were determined from stand tests in which there was freedom only in roll. Flight tests of the model were made over a range of lift coefficient from 1.0 through the stall. NACA TN 2247.

EFFECT OF END PLATES ON SWEPT WINGS AT LOW SPEED, by John M. Riebe and James M. Watson. U. S. National Advisory Committee for Aeronautics. Nov 1950. 58p photos, diagrs, graphs, tables Mi $2.75, Ph $7.50. PB 102588

An investigation was made in the Langley 300 MPH 7- by 10-foot tunnel to determine the effects of various sizes and shapes of end plates on the aileron characteristics and on the aerodynamic characteristics in pitch and yaw of a wing of aspect ratio 2, no taper, and a sweepback of 45° and of a wing of aspect ratio 4, taper ratio 0.6, and sweepback of 46.7°. Free-roll characteristics were obtained with two end-plate configurations on a wing of aspect ratio 3, taper ratio 0.6, and a sweepback of 35° in order to determine the effect of end plates on wing damping in roll. NACA TN 2229.

EFFECT OF NONUNIFORM TEMPERATURE DISTRIBUTIONS ON THE STRESSES AND DISTORTIONS OF STIFFENED-SHELL STRUCTURES, by Richard R. Heldenfels. U. S. National Advisory Committee for Aeronautics. Nov 1950. 50p diagrs, graphs, tables Mi $2.50, Ph $6.25. PB 102587

The structural effects of nonuniform temperature distributions, such as those produced by aerodynamic heating or thermal ice-prevention systems, are discussed and found to be of two types: The introduction of thermal stresses and distortions as a result of restrained thermal expansion and a change in the stresses and distortions produced by the applied loads as a result of the variation of elastic properties of materials with temperature. These effects are illustrated by sample analyses of the stress and distortion distributions of simple box beams and by calculation of the stresses on a typical wing section. NACA TN 2240.

EFFECTS OF MACH NUMBER UP TO 0.34 AND REYNOLDS NUMBER UP TO 8 X 10^6 ON THE MAXIMUM LIFT COEFFICIENT OF A WING OF NACA 66-SERIES AIRFOIL SECTION, by G. Chester Furlong and James E. Fitzpatrick. U. S. National Advisory Committee for Aeronautics. Dec 1950. 40p photos, diagrs, graphs, tables Mi $2.25, Ph $5.00. PB 102584

The effects of Mach number up to 0.34 and Reynolds number up to 8 x 10^6 on the maximum lift coefficient of a wing of NACA 66-series airfoil sections are presented. The wing was tested with full-span and partial-span split flaps deflected 60° and without flaps. The results indicated that the peak values of maximum lift coefficient occurred at free-stream Mach numbers of approximately 0.212 and 0.227 for the flaps-retracted configuration and 0.138 and 0.196 for the full-span flaps-deflected configuration for tunnel pressures of 33 and 14.7 pounds per square inch, respectively. NACA TN 2251.

FORMULAS FOR SOURCE, DOUBLET, AND VORTEX DISTRIBUTIONS IN SUPERSONIC WING THEORY, by Harvard Lomax, Max A. Heaslet, and Franklyn B. Fuller. U. S. National Advisory Committee for Aeronautics. Dec 1950. 35p diagrs Mi $2.25, Ph $5.00. PB 102509

The formulas of supersonic wing theory for source, doublet, and vortex distributions are reviewed and a systematic presentation is provided which relates these distributions to the pressure and to the vertical induced velocity in the plane of the wing. It is shown that care must be used in treating the singularities involved in the analysis and that the order of integration is not always reversible. Further, it is shown that the use of the complex variable can often facilitate the calculation of the integrals involved. NACA TN 2252.

IMPROVED APPROXIMATE METHOD FOR CALCULATING LIFT DISTRIBUTIONS DUE TO TWIST, by James C. Sivells. U. S. National Advisory Committee for Aeronautics. Jan 1951. 35p Mi $2.25, Ph $5.00. PB 102669

A new method is presented for calculating the lift distribution due to twist which gives a much closer approximation than the empirical method of Schrenk and requires about the same amount of computing. The new method, based on lifting-line theory, makes use of the lift distribution due to angle of attack and takes into account the aspect ratio of the wing. Examples are presented for the four main types of twist: symmetrical, antisymmetrical, continuous, and discontinuous. The applicability of the method for swept wings is also presented. NACA TN 2282.

INVESTIGATION IN THE LANGLEY 19-FOOT PRESSURE TUNNEL OF TWO WINGS OF NACA 65-210 AND 64-210 AIRFOIL SECTIONS WITH VARIOUS TYPE FLAPS, by James C. Sivells and Stanley H. Spooner. U. S. National Advisory Committee for Aeronautics. Aug 1947. 26p photos, drawings, graphs, tables Available from U. S. Supt. of Documents, U.S. Government Printing Office, Washington 25, D. C. $.25. PB 102253

An investigation has been conducted in the Langley 19-foot pressure tunnel to determine the maximum lift and stalling characteristics of two thin wings

equipped with several types of flaps. Both wings had zero sweep, and aspect ratio of 9, and a taper ratio of 0.4. Cover date is 1949. NACA Report 942.

ON A SOURCE-SINK METHOD FOR THE SOLUTION OF THE PRANDTL-BUSEMANN ITERATION EQUATIONS IN TWO-DIMENSIONAL COMPRESSIBLE FLOW, by Keith C. Harder and E. B. Klunker. U. S. National Advisory Committee for Aeronautics. Dec 1950. 10p Mi $1.25, Ph $1.25. PB 102504

The recently derived particular integrals of the Prandtl-Busemann iteration equations make possible the extension of the familiar source-sink concept to the solution of the higher-order iteration equations for the subsonic potential flow over thin symmetric two-dimensional profiles. An explicit expression is derived for the second-order velocity potential and velocity components and a method for obtaining the higher-order terms is indicated. The velocity at the surface of the Kaplan bump is evaluated to illustrate the method. NACA TN 2253.

PRECIPITATION STATIC TESTS OF SURFACE COVERINGS FOR AIRCRAFT. FINAL REPORT, CONTRACT W-33-038-SC-19, by R. H. George. Purdue University. Engineering Experiment Station, Lafayette, Ind. Aug 1945. 116p photo, graphs, tables (part fold) Mi $4.75, Ph $15.00. PB 102409

It was found that the charging rate of surfaces varies widely with angle of incidence and may even reverse polarity; that it varies approximately as the cube of the velocity of aircraft; that the effect of relative humidity varies considerably for different surfaces, however for all of the good anti-static surfaces the charging rate decreases if the polarity is negative and may reverse with increase in relative humidity but if the polarity is positive the charging rate increases with increase inhumidity. The usual types of snow and frost crystals produce a negative charge on most surfaces. Methods were found to cause aluminum to take either negative or a positive charge under bombardment with the usual form of snow.

ROLLING AND YAWING MOMENTS FOR SWEPT-BACK WINGS IN SIDESLIP AT SUPERSONIC SPEEDS, by Seymour Lampert. U. S. National Advisory Committee for Aeronautics. Jan 1951. 54p diagrs, graphs, table Mi $2.75, Ph $7.50. PB 102606

A method is presented for determining the rolling and yawing moments of swept-back wings in steady sideslip at supersonic speeds. The case treated in particular is that of a swept tapered wing with all edges subsonic. NACA TN 2262.

SOME EFFECTS OF NONLINEAR VARIATION IN THE DIRECTIONAL-STABILITY AND DAMPING-IN-YAWING DERIVATIVES ON THE LATERAL STABILITY OF AN AIRPLANE, by Leonard Sternfield. U.S. National Advisory Committee for Aeronautics. Nov 1950. 19p drawings, table Mi $1.75, Ph $2.50. PB 102287

The effect of nonlinear stability derivatives on the lateral stability of an airplane is analyzed. Motions are calculated on the assumption that the values of the directional-stability derivative and the damping-in-yawing derivative are functions of the angle of sideslip. The application of the Laplace transform to the calculation of the airplane motion when certain types of nonlinear derivatives are present is described in detail. NACA TN 2233.

SOME THEORETICAL LOW-SPEED LOADING CHARACTERISTICS OF SWEPT WINGS IN ROLL AND SIDESLIP, by John D. Bird. U. S. National Advisory Committee for Aeronautics. Dec 1948. 20p diagrs, graphs, tables Available from Supt. of Documents, U. S. Government Printing Office, Washington 25, D. C. $.20. PB 102567

1. Wings, Sweptback - Lift distribution 2. Wings, Sweptback - Loading 3. Wings, Sweptback - Rolling moments 4. Weissinger method (Span loading) 5. U. S. Langley Aeronautical Laboratory, Langley Air Force Base, Va. 6. NACA Report 969.

Cover date is 1950. For Weissinger method for determining span loading and lift distribution of swept-back wings see also NACA TM 1120.

SPANWISE DISTRIBUTION OF LIFT FOR MINIMUM INDUCED DRAG OF WINGS HAVING A GIVEN LIFT AND A GIVEN BENDING MOMENT, by Robert T. Jones. U. S. National Advisory Committee for Aeronautics. Dec 1950. 14p diagrs, graphs Mi $1.75, Ph $2.50. PB 102586

The problem of the minimum induced drag of wings having a given lift and a given span is extended to include cases in which the bending moment to be supported by the wing is also given. Expressions for the spanwise load distribution and the minimum drag in terms of the lateral position of the load centroid are given. The results show a 15-percent reduction of the induced drag with a 15-percent increase in span over that for an elliptic loading having the same total lift and bending moment. NACA TN 2249.

THEORETICAL DAMPING IN ROLL AND ROLLING EFFECTIVENESS OF SLENDER CRUCIFORM WINGS, by Gaynor J. Adams. U. S. National Advisory Committee for Aeronautics. Jan 1951. 29p diagrs, graphs Mi $2.00, Ph $3.75. PB 102603

The coefficient of damping in roll and the rolling effectiveness (with differential incidence of the horizontal surfaces) are determined for a slender, equal-span, cruciform wing. It is found that the coefficient of damping in roll is 62 percent greater than for a plane slender wing of equal aspect ratio, and that the rolling effectiveness is 53 percent less than for a plane slender wing of equal aspect ratio. The analysis is based on the slender-wing theory. The method of analysis can be used in the estimation of the characteristics of a slender, equal-span, cruciform wing having any specified distribution of normal velocity components on the horizontal and vertical surfaces. NACA TN 2270.

THEORETICAL SYMMETRIC SPAN LOADING DUE TO FLAP DEFLECTION FOR WINGS OF ARBITRARY PLAN FORM AT SUBSONIC SPEEDS, by John DeYoung. U. S. National Advisory Committee for Aeronautics. Jan 1951. 70p graphs, tables Mi $3.00, Ph $8.75. PB 102607

A procedure based upon a simplified lifting-surface theory that includes effects of compressibility and span-wise variation of section lift-curve slope is presented in such a manner that the spanwise loading due to flap deflection can be simply found for wings having symmetric plan forms with constant spanwise sweep angle of the quarter-chord line. Aerodynamic characteristics due to flap deflection are considered and for straight-tapered wings values of certain of these characteristics are presented in charts for a

range of swept plan forms. Further use of the method gives downwash in the vertical center of the wake of the wing. NACA TN 2278.

THREE-DIMENSIONAL, UNSTEADY-LIFT PROBLEMS IN HIGH-SPEED FLIGHT- BASIC CONCEPTS, by Harvard Lomax, Max A. Heaslet, and Franklyn B. Fuller. U. S. National Advisory Committee for Aeronautics. Dec 1950. 39p diagrs Mi $2.25, Ph $5.00. PB 102490

The problem of the build-up of lift on two- and three-dimensional wings flying at high speeds is discussed as a boundary-value porblem for the classicial wave equation. Kirchhoff's formula is applied so that the analysis is reduced, just as in the steady state, to an investigation of sources and doublets. Some simple applications of this method are considered, including the determination of the starting lift of a three-dimensional wing and the potential functions for some types of unsteady vortex motion. NACA TN 2256.

Instruments

FLIGHT INVESTIGATION OF THE EFFECT OF VARIOUS VERTICAL-TAIL MODIFICATIONS ON THE DIRECTIONAL STABILITY AND CONTROL CHARACTERISTICS OF A PROPELLER-DRIVEN FIGHTER AIRPLANE, by Harold I. Johnson. U. S. National Advisory Committee for Aeronautics. 1950. 22p photos, drawings, graphs Available from Supt. of Documents, U. S. Government Printing Office, Washington 25, D. C. $.20. PB 102513

1. Stability, Directional 2. Stabilizers, Vertical - Design 3. Airplanes - Fighter - Aerodynamics 4. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 5. NACA Report 973.

RADAR METHOD OF CALIBRATING AIRSPEED INSTALLATIONS ON AIRPLANES IN MANEUVERS AT HIGH ALTITUDES AND AT TRANSONIC AND SUPERSONIC SPEEDS, by John Zalovcik. U. S. National Advisory Committee for Aeronautics. 1950. 10p diagrs, graphs Available from Supt. of Documents, U. S. Government Printing Office, Washington 25, D. C. $.15. PB 102512

1. Pitot-static tubes - Calibration 2. Airplanes - Speed - Measurements 3. Velocity, Supersonic - Measurements 4. Velocity, Transonic - Measurements 5. U. S. Langley Aeronautical Laboratory, Langley Field, Va. 6. NACA Report 985.

RATE OF ROLL INDICATOR WITH UNBONDED STRAIN GAGE PICKOFF, DEVELOPED UNDER CURTISS-WRIGHT RESEARCH LABORATORY PROJECT EI-135-P, by E. G. Albrecht, K. D. Swartzel, C. L. Frederick. Cornell Aeronautical Laboratory, Inc., Buffalo, N. Y. Feb 1946. 20p photos, diagr, graphs Mi $1.75, Ph $2.50. PB 102630

1. Indicators, Rate of roll 2. Gates, Strain 3. CAL RLM-12.

SURVEY OF STABILITY ANALYSIS TECHNIQUES FOR AUTOMATICALLY CONTROLLED AIRCRAFT, by Arthur L. Jones and Benjamin R. Briggs. U. S. National Advisory Committee for Aeronautics. Jan 1951. 113p diagrs, graphs, tables Mi $4.75, Ph $15.00. PB 102602

A survey of the stability analysis techniques for automatically controlled aircraft is presented. The survey is limited to techniques commonly applied to linear, continuous-control systems wherein the difference between the output and input quantities is measured continuously and is used in the operation of the system (a closed-loop system). An evaluation of the techniques, based on the kind and amount of information derivable, is included. An illustrative example is also presented to demonstrate the calculations involved for a typical aircraft-autopilot combination. NACA TN 2275.

WIND-TUNNEL INVESTIGATION OF A NUMBER OF TOTAL-PRESSURE TUBES AT HIGH ANGLES OF ATTACK, SUPERSONIC SPEEDS, by William Gracey, Donald E. Coletti, and Walter R. Russell. U. S. National Advisory Committee for Aeronautics. Jan 1951. 44p photos, drawing, graphs, tables Mi $2.50, Ph $6.25. PB 102564

A wind-tunnel investigation has been conducted to determine the effect of inclination of the air stream on the measured pressures of 20 total-pressure tubes having cylindrical-, conical-, and ogival-nose sections through an angle-of-attack range of -15° to 45° at Mach numbers 1.62, 1.94, and 2.40. Results obtained with these same tubes at subsonic speeds have been previously reported in NACA RM L50G19. NACA TN 2261.

Engines and Propellers

CYLINDER HEAD AND BARREL XI-2220 AIRCRAFT ENGINE, by F. S. Leon. Chrysler Corporation, Detroit, Michigan. May 1944. 9p drawings, graphs, tables Mi $1.25, Ph $1.25. PB 102530

Tests were made of six used cylinders assembled with six aluminum cylinder head seal Shrink test rings to determine deflection and permanent set of both head and barrel when a assembled with interreference fits ranging from .0067 to .0205 in. It was concluded that within this range, permanent set is essentially independent of shrink. No indications were found that change in interference fit from present specifications (.016-.012 in.) would result in improvement. Technical report A-60209.1. Contract W-535-ac-15165 article 1 (e) item 1 (h) (6). Title page will not reproduce well.

ERFAHRUNGEN BEI DER ELEKTROAKUSTISCHEN KLOPFUNTERSUCHUNG VON FLUGMOTOREN (EXPERIENCES IN ELECTRO-ACOUSTIC EXAMINATION OF KNOCK PHENOMENA IN AERO ENGINES), by Dr. Ing. Paul Funck. Institut für Chemische Technologie. Versuchslaboratorium für Mineralöle, Munich. May 1943. 50f photos, drawings, graphs (Text in German) Mi $2.50, Enl Pr $7.50. PB 102656

1. Engines, Aircraft - Knocking - Germany 2. Micro BIOS FD 2873/46, Item 22, Frames 000753-000801.

Abstract available as PB 102656s. 2p. Mi $1.25, Ph $1.25.

NOTE ON TURBO-JET AFTER-BURNERS, by John G. Wilder, Jr. Cornell Aeronautical Laboratory, Inc., Buffalo, N. Y. Feb 1949. 14p diagrs, fold, table Mi $1.75, Ph $2.50. PB 102652

1. Afterburning 2. Jet engines, Turbo-jet - Thermodynamics 3. CAL DB-607-A-1.